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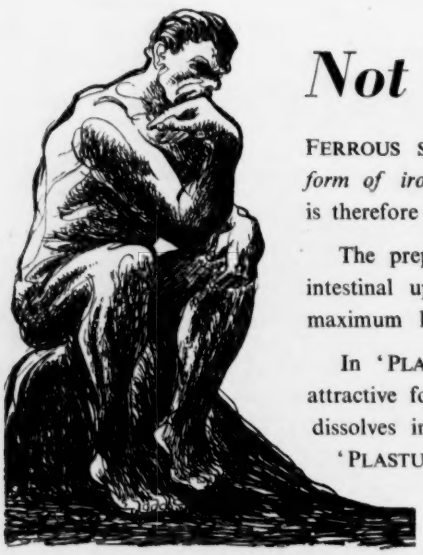

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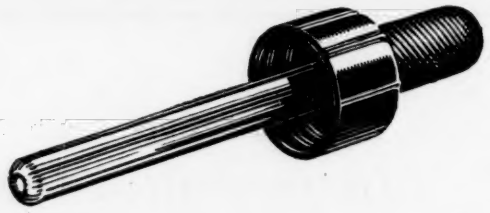

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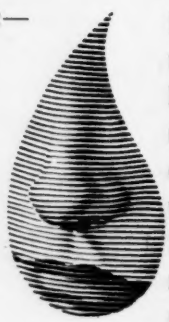

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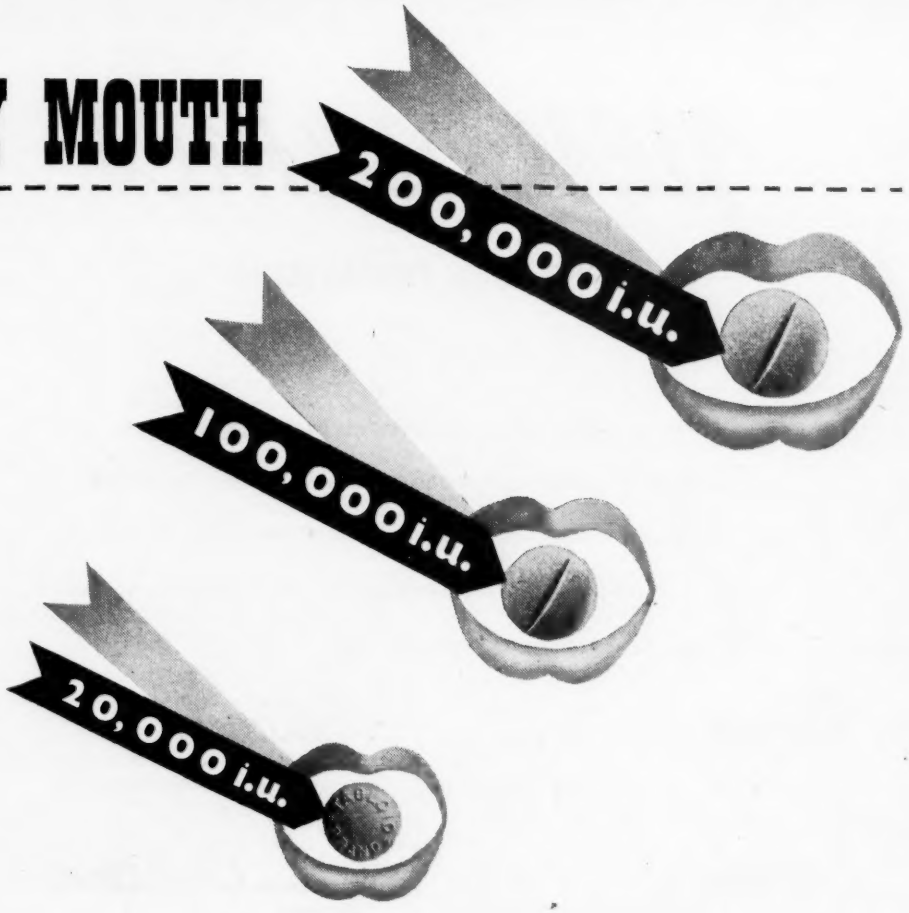

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CHIEF MEDICAL OFFICER, MINISTRY OF HEALTH AND MINISTRY OF EDUCATION

"History cannot, like physical science, deduce causal laws of general application. All attempts have failed to discover laws of 'cause and effect' which are certain to repeat themselves in the institutions and affairs of men."

"An historical event cannot be isolated from its circumstances, any more than the onion from its skins, because an event in itself is nothing but a set of circumstances, none of which will ever recur."—GEORGE MACAULAY TREVELYAN, *Clio, A Muse*, 1913.

THESE obiter dicta, from an essay written by Trevelyan in his nonage, seem to imply that history never repeats herself, and that mankind rarely retravels the same road. Taken to the final iota that is strictly and precisely true; but it is equally demonstrable that the festivals of the Church recur, that year by year we can say with Horace *diffugere nives, redeunt jam gramina campis*, that the pattern of life is often repetitive.

With those thoughts at the back of my mind, I lately betook myself to the columns of *The Times* for the late September and early October of 1851. There immediately I found confirmation. The cool days of September in that year were a time of accumulated and belated pilgrimages to the dying Great Exhibition. There were the same suggestions that those fading glories might be extended. There were the same refusal and the same determined and well-regulated obsequies. Even in the political and international fields there were similar tremors and convulsions. But I would particularly direct your attention to the advertisements which appeared on Sept. 30, intimating that on Oct. 1 introductory addresses, open to the public, would be given at some five or six of the medical schools of London. Moved to know more about these, I procured *The Lancet* for Oct. 4, 1851; and there, enshrined (or more correctly speaking entombed) for all posterity, I found "A glance at the introductory lectures delivered at the various medical schools in London at the opening of the session 1851."

Exercising the licence of a resurrectionist I have assembled a selection of parts and members of these hundred-year-dead orations, and shall present it to you as a typical "corpus."

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Let us imagine ourselves at St. Andrew's Hospital and College at seven o'clock on the evening of Wednesday, Oct. 1, 1851.

"The large and handsome hall was occupied by about three hundred governors, students, visitors, &c., together with the medical and surgical and collegiate staff, when Dr. Bartholomew [the name is apocryphal] commenced his introductory lecture.

"He first dwelt on the advantage to the student in medicine of referring to the experience of past ages, and also of cultivating a high moral tone of feeling and conduct. He considered that medicine, ere long, might become ranked amongst the exact sciences, as are now astronomy and chemistry; he attributed the rank which those branches of knowledge have taken, to the employment of mathematical and arithmetical processes, and the Baconian system of reasoning with respect to them. He looked forward with satisfaction to the period when the same principles should be more widely applied in the study of the healing art, and urged strongly the necessity of students in medicine having embarked in preliminary mathematical studies to this end. In particular, he drew attention to the vast advance which chemistry had made; in consequence of the rigid application of sound and philosophic principles to its study, wonders had been effected—as, for instance, those of the electric telegraph, and of photography—which realised some of the wildest dreams of the alchemists or of Oriental romance. In all the early vagaries of the human mind some germ of truth was to be found, and he anticipated that hereafter strict reasoning and observation would unveil how far planetary influences exercised any physical effect upon the inhabitants of this globe.

"In the second part of this address Dr. Bartholomew contrasted disease with health, and showed that no line of demarcation can be accurately drawn between the two, for that insensibly the one runs into the other. From this flows a high mental gratification in the practice of diagnosis and prognosis, though difficulties are creating in the exercise of the *ars therapeutica*. All this emphasised the importance, nay necessity, for a frequent attendance in the wards of the hospital. There only, at the bedside, could be learned the practical application of knowledge obtained at lectures and from books. The deportment of the medical man in the sick chamber was commented on, and kindness to the poor, both in health and sickness enjoined.

"Dr. Bartholomew continued:

'By this kindly consideration much may be accomplished, and we should never forget that in the treatment of the sick in hospital, and at their own miserable dwellings, we have not only to combat with illness, but to attack it in the formidable garb of associated poverty. Disease and Want are in league to destroy; skill and kindness should combine to preserve. In your attendance upon the sick you should be cheerful but not frivolous, attentive but not obtrusive, determined though not ungentle. You may oftimes do as much by thus instilling a confident reliance, as by directing an appropriate medicine.

'I would advise you to enter upon your studies with patience and perseverance, but free from that injudicious ardour which would overleap difficulties at a bound and seize upon knowledge at a grasp. Such undue efforts are profitless and enervating. With the talented author of *Proverbial Philosophy*, Mr. Martin [Farquhar] Tupper, I would say: "Let the cool streams of prudence temper the hot springs of zeal; So shalt thou gain the honourable end, nor lose the midway prize; So shalt thy life be useful, and thy young heart happy."'

"In the third part, the subject of which was well timed, Dr. Bartholomew humorously stated some of the bygone absurdities of quackery, and then contrasted them with the fallacies of the present day, showing that in the latter:

'What is new is not true,
And what is true is not new.'

He considered it as beneath serious consideration to enter upon a refutation of that transcendental delusion homœopathy, but he thought it worth while to point out the utter incompetency of legislators, clergymen, soldiers, and others to decide upon the merits of homœopathy, and their presumption in denouncing the practice of rational medicine. He supported these views by referring to the precepts of the Archbishop of Dublin, Dr. Whately, whom the globulists ranked amongst their more distinguished converts, and who had palpably stultified his own lessons in venturing upon the decision of medical questions.

"The subject of preventive medicine was then introduced, and thereafter Dr. Bartholomew proceeded to the principal remaining feature of his address—the demand for medical reform. He advocated that all the present qualified members of the medical profession should be organised into one great medical University, that those members at large should choose their Senate, that the present examiners of the examining bodies should constitute the first board to grant degrees, which board should be afterwards filled up from the body of the University—that the degrees should be Bachelors and Masters of Medicine (corresponding to what are now called general practitioners), and Doctors of Medicine or of Surgery (corresponding to those practising as physicians or pure surgeons).

* Inaugural lecture to the D.P.H. Class at the London School of Hygiene and Tropical Medicine, Oct. 1, 1951.

"After another eulogium of the Baconian philosophy, Dr. Bartholomew terminated his discourse in the following words.

'Whilst we your seniors inculcate a zealous and industrious use of the time devoted to study, we recommend also a moderate amount of relaxation, for the brain when left too long in a state of excitement is predisposed to become diseased. We advise you, therefore, during your stay in the Metropolis to avoid every haunt of dissipation and vice, and to bear in mind that if much depends on us, your teachers, far more depends upon yourselves. If you do so, the journey end of your pupilage will be rewarded with that becoming satisfaction which engenders reliance upon self, has sprung from merit, and been fostered to maturity by perseverance.'"

THE PROFESSION IN 1851

It was a somewhat odd medical world that the neophytes there present desired to enter. Earlier in the year the Sixth National Census had been taken. It disclosed for England and Wales a population of 18 million, amongst whom some 17,469 persons were professing the practice of medicine and surgery in one form or another. That total included not only the recognisably qualified practitioners but their students and assistants also, and, as the Census report has it, "Empirics of various kinds, worm doctors, homœopathic professors, herb doctors and hydropathic practitioners."

Even for the reputed doctors, there was a discrepancy between the numbers recorded in the Census and those borne on the books of the Royal Colleges and of the Society of Apothecaries. To give one instance only, 1771 persons in England and Wales claimed to be pure physicians. The Royal College of Physicians, sitting like a Miltonic gryphon on guard over the portals of consulting practice, would recognise no more than 671 of these gentlemen, and, for the rest, would challenge their legal right—even though they constituted one-half of the physicians on the staffs of the provincial hospitals—to practise as such in England. Even in 1851 the college through its published by-laws was arrogant enough to remind the "hoi polloi" of the medical world that it had power to commit to Newgate those who transgressed against its authority. Another seven years were to pass before the Medical Act of 1858 brought light and order into this chaos, and created the identifiable and legally endowed medical profession that we know.

Apart from this condition of almost mortal disorder in the hierarchy of medicine, it was a very queerly composed profession. Its social gradations ranged from the aristocratic to the menial and even mercantile. There were at least three main groupings, each with its own orders and sub-orders. One might be regarded as comprising the working apprentices, the unqualified assistants, and the apothecary druggists. The next included the qualified apothecary surgeons, for whom social gifts were a distinct advantage. (The appropriate qualities and attributes would be set out in the advertisements of practice vacancies: "A gentleman who hunts will be preferred"—or perhaps, "Interested parties should play a good game of whist.") And finally, on the one hand the fossilised and relatively poor fellow of the college in Pall Mall East, and, on the other, the fashionable surgeon touching his £10,000 a year. Such an one would see twenty patients in his consulting-room between 10 A.M. and lunch time and record in his diary that the day's bag embraced a Baron, a Viscount, a Countess, and a Marquess.

I do not include in this catalogue the medical officers of health, because at that moment they could be counted on the fingers of one hand.

TROUBLES OF ASSISTANTS

In 1851 *The Lancet* carried the cri-de-coeur of the assistants. An egregious Mr. Spong had depicted "a professional view" of the advantages accruing from an assistantship of one or two years.

"In such an engagement," he wrote, "the young practitioner can practise his eye in the physiognomy of disease, attune his ear to the morbid music of the thorax, educate his finger in the department of obstetrics, study the employment of the light and heavy artillery of therapeutics, and learn how to handle those six divine remedies—mercury, iodine, quinine, opium, tartar-emetic and epsom salts."

Remembering that the assistant, "although a mere sojourner in the land, a stranger among strangers, was also a brother practitioner," Mr. Spong recommended that "he should be treated as a gentleman in word, thought and deed"—and rewarded by a salary of from 30 to 40 pounds per annum.

Mr. Spong's Utopia did not appear to have many contented citizens. One gentleman, "Aretalogos, B.A., M.R.C.S.," sketched briefly his duties in an Essex situation. During a sojourn of seven months, he had been disturbed at night 90 times to proceed on journeys varying from three to eight miles; he had visited, prescribed, and dispensed for private, pauper, and club patients, had kept the books, written out the bills, dusted the bottles, and made the tinctures, and had resisted all the time the temptation to which five out of nine of all assistants succumbed—either to terminate their lives by the prussic-acid bottle, or to become confirmed drunkards in wild despair. An Irish "Anguis in Herba" summarised his day and duties thus:

"to be ready all night to attend all calls on the bell, not to lie an hour in the morning even though up all night, to dine by himself or with the servants at two o'clock (the family hour being five) or alternatively 'to leave the dinner-table with the cheese,' to take supper in the surgery, to give no drugs (except the worst) to paupers, 'to use the lancet and spare the leech.'"

THE RECRUITS TO MEDICINE

One of the advantages of this pleomorphism of the medical profession was that it was thereby enabled to recruit its members from all levels of society. No other system or lack of it would have given opportunities to persons of such humble origin as William Farr, the Registrar-General's compiler of abstracts, or Edwin Lankester, the founder of the great dynasty of biologists which bears that name. Both these men had fathers who were little better than agricultural labourers.

Only a few medical students passed through the public schools and the older English universities. The day of the provincial university was not yet, though in most of the leading centres medical schools had been established, which obtained their students from the local grammar schools.

One other source must be mentioned. There existed at Tarvin Hall in Cheshire a strange polytechnic, the Provincial Medical Collegiate Institution, for the education of 100 resident pupils intended for the medical profession. To these youths it furnished a complete course of practical instruction; for, in addition to classics, mathematics, and the French and German languages, chemistry, botany, materia medica, osteology, and figure drawing were taught by duly qualified members of the profession. It was also possible to study dancing, music, and the principles of fortification and military drawing. It would be interesting to pursue the history of this academy and to follow the careers of some of its alumni.

INSTRUCTING THE STUDENT

The general content of medical education can be gauged from the inaugural address I have described above.

There was a commencing recognition of the place and purpose of physics and chemistry, though biology only included botany, and that with its better eye fixed on materia medica. Anatomy was taught assiduously, and physiology with mounting enthusiasm. For some reason or another the medical school authorities at Guy's

considered it advisable that the hospital chaplain should deliver a course of lectures on moral philosophy.

Pathology was still largely the perquisite of the surgeon, many of whom graduated from the dead-house, and continued to commute between it and the operating-theatre proper.

We can get a good idea of how clinical medicine was taught if we imagine ourselves for a moment as being in the company of Dr. Theophilus Thompson on one of his rounds at the Brompton Hospital.

"At our last meeting, gentlemen, I brought under your observation all the hospital patients at present under my care who have, for any considerable time, taken cod-liver oil. They have all, though in different degrees, experienced benefit from its use.

"In proceeding to place before you examples of the effect of other analogous remedies, it is my impression that you will be led to agree with me that fish oils generally resemble one another in medical properties. Other animal oils besides those obtained from fish have long engaged a popular reputation. In South America remedial efficacy is attributed to the oil of the condor, and in the backwoods of the United States to that of the rattlesnake, and it may not be inappropriate to mention that I recently received a present of oil of scorpions. The flesh of the viper has been employed from the very commencement of the Christian Era. Galen believed it to be efficacious in elephantiasis, and our distinguished countryman Roger Bacon describes the case of a young German lady whose constitution was so impaired that her hair and nails came off, but who, on a persevering diet of vipers' flesh, became in appearance younger and more beautiful than ever. With a view to determining whether remedial efficacy was inherent in animal oil generally, it occurred to me some time ago to try the effect of the oil obtained from the feet of the young heifer —neat's-foot oil. In the first half of 1849 I recorded the weights of 14 phthisical patients who were put under the use of this oil. Three of the patients derived essential benefit, four were slightly relieved, five received no obvious advantage, and two retrograded rapidly.

"Here is a favourable case.

J.K., a tailor, aged 34, unmarried, square built, of middle stature and dark complexion, was admitted as an in-patient. Born in Cork, he had lived 15 years in London, accustomed to sleep in a close room, and work in a confined apartment with from 40 to 60 companions. Always faint and weak in the evening and occasionally indulging in drinking bouts; for three years unemployed in the winter, has had syphilis and gonorrhœa. His brother recently died in this hospital. He lost a sister, aged 16, from phthisis, and probably his mother at the age of 38.

Physical signs on admission. Respiration abdominal. Left side, apex expiratory murmur equal in duration to the respiratory. Right side, percussion dull over the whole side. Amphoric voice above the mamma. Legs much swollen from œdema. Has profuse night sweats, and expectorates about a pint in 24 hours, but has never had hæmoptysis.

Treatment. Ordinary diet with eggs and extra milk. Cod-liver oil externally and internally. For the cough blisters were applied, and he took in succession hydrocyanic acid, four minim doses of tincture of aconite in spermaceti mixture, and afterwards morphia, with which gallic acid was combined to moderate the perspiration. A month later his symptoms were aggravated and his weakness increasing. I determined to give a trial to neat's-foot oil. Under this treatment the pulse which on 29th December was 100, gradually improved, being on January 9th 84 and fuller, and on the 4th February 80. The weight steadily improved from seven stones $5^3/_4$ lbs. on the 4th February to seven stones $9^1/_2$ lbs. on the 16th April. The respiration on the left side improved and amphoric sound superseded the gurgling previously heard on the right. He then left the hospital so much improved as to be able to resume his work.

His blood was obligingly examined for me by Mr. Rodgers, who reported that there was fully the healthy average of red corpuscles."

Such was the teaching of Theophilus Thompson. Better than most, he did not concern himself entirely with "cavernulous" breathing, and the significance of the prolongation of the expiratory murmur, but was alive to some of the social factors in the causation of disease.

TEACHING OF HYGIENE

The University of London admittedly included hygiene in the subjects to be studied for its degrees; yet it was not until five years later—in 1856—that Dr. Edward Headlam Greenhow gave a short course of lectures on public health as part of the annual systematic teaching of the medical school of St. Thomas's Hospital. By reason of the insufficiency of the available statistical material Dr. Greenhow found himself, "like the proverbial brickmaker, without straw—though the brickmaking was purely honorary"—and set about to supply the deficiency. The result of that research appeared in 1858. It took the shape of a Government publication, "Papers relating to the sanitary state of the people of England," to which John Simon contributed a classic introduction "On the Preventability of certain kinds of Premature Death." The blue-book became, as it were, the textbook and source-book for those earliest students of public health at St. Thomas's Hospital. But that was in 1858, and by then Simon had been installed as medical officer of the General Board of Health for nearly three years, dividing his time between Whitehall as a Civil Servant and St. Thomas's Hospital, which he still continued to serve as a surgeon.

Yet in 1851, the *annus mirabilis*, the views of Simon could be read both in the pages of *The Lancet*, and in his annual report as medical officer of health of the City of London. His is one of the three most authoritative voices in preventive medicine in the 19th century. We must listen to it for a few moments before turning, in conclusion, to the organ notes of William Farr—the greatest evangel of the mission of vital statistics in this or any other epoch.

Simon had operated on a child of 7 with enlarged cervical glands. He had carried out an extensive dissection, the patient being under chloroform anæsthesia. Twelve days later it was discovered that air was escaping in bubbles from the lower part of the granulating wound at about the centre of the clavicle. A month later the child died. In writing up the case in *The Lancet* Simon commences with this preamble.

"That the strumous diathesis is transmissible by heredity is a pathological fact which is unfortunately but too well ascertained. How much greater would be the utility of this knowledge if we were given an opportunity of counteracting the tendency to scrofulous diseases, rather than requested to prescribe for them when they are unmistakably developed. Were medical men more frequently consulted as to the general management of children before the morbid germ begins to show . . . visible manifestations, a host of evils would be avoided. But how often would our best intentions and admonitions be of no avail. How can the medical practitioner rescue from its wretched abode the child born in indigence and want, whose weakly frame . . . is exposed to the most effective causes of debility—bad air, bad food and exposure to wet and cold. There are certainly a great number of avoidable diseases, but to prevent the development of a great many of them the powerful hand of the legislator must lend its support to the benevolence of the medical profession. There are in large cities hothouses of scrofulous maladies which as certainly send their supply to our hospitals as the gardener sends the results of his artificial contrivances to market. Remove or regenerate them and it will not so often be the melancholy duty of the medical man to watch the progress of diseases which his best efforts . . . cannot check."

So wrote Simon the surgeon of St. Thomas's Hospital. Hear him again out of the pages of his second annual report to the Hon. the Commissioners of Sewers of the City of London (Nov. 26, 1850).

"This is evil enough but worse remains behind. It is no uncommon thing, in a room of 12 feet square or less, to find three or four families styed together filling the same space night and day—men, women and children, in the promiscuous intimacy of cattle.

"In my former report I drew your attention to this pestilential heaping of human beings and suggested to you its results. I revert to it because of its infinite importance. I have to deal with the matter only as it relates to bodily health. Whatever is morally hideous and savage in the scene—whatever contrast it offers to the superficial magnificence of the Metropolis—whatever profligacy it implies and continues—whatever debasement or abolition of God's image in men's hearts is tokened by it—these matters belong not to my office.

"Only because of the physical sufferings am I entitled to speak, only because pestilence is for ever within the circle, only because death so largely comforts these poor orphans of civilisation.

"To excuse the length at which I have addressed you, I have but another word to say. If the deliberate promises of science be not an empty delusion it is practicable to reduce human mortality within your jurisdiction to nearly the half of its present prevalence. Notwithstanding all that medicine can achieve to succour the body as it struggles against actual disease . . . all past experience, and every transaction of our daily practice, confirm the popular adage that prevention is better than cure. While curative medicine, . . . ministering step by step to the individual units of a population, can produce only minute and molecular changes in the health of society, Sanitary law, embodying the principles of preventive medicine, may ensure to the aggregate masses of the community prolongation of life and diminution of suffering, in the working of some single enactment it may affect the lives of generations of men, and may moderate in respect of millions the sources of orphanage and poverty."

FOUR VOICES

I would revert to George Macaulay Trevelyan, and Clio, the Muse of History; for in my beginning is my end.

In the latter part of the essay to which I have referred, Trevelyan comments on the fact that the impressions made on the mind by the contemporary impact and drama of great events differs materially from the retrospective recollections which the compensating and balanced memory affords. Yet the agonies of the spirit under the assault of new experience are just as significant as maturer judgments on events "calmly reviewed, cold and dead, in the perspective of subsequent happenings."

"Now," says Trevelyan, "if so great a change of emotional attitude towards an event can take place in the same person within a few years, how very different must our view of the Battle of Waterloo and the Reform Bill of 1832 be from the aspect which first they bore to our grandfathers and great-grandfathers, men so different from ourselves, brought up in habits of thought and conduct long passed away.

"To recover some of our ancestors' real thoughts and feelings is the hardest, subtlest and most educative function that the historian can perform. To give a true picture of any country, or man or group of men, in the past requires industry and knowledge. For only the documents can tell us the truth, but it requires also insight, sympathy and imagination of the finest."

"For only the documents can tell us the truth." That is why over a hundred years I have invoked the assistance of the several voices you have heard—the apocryphal but composite Bartholomew, the didactic clinician Theophilus Thompson, the persistent administrator of genius John Simon, the evangelist William Farr. Our time is removed from theirs, but our interests are in all respects the same—the enlargement of man, in length of days, in usefulness, and in happiness. No-one has described that intention more eloquently than Farr. The passage with which I conclude is enshrined (not entombed) in his report on the Census of 1851. It is a statement of policy in the majestic language of Isaiah:

"The prolongation of the life of the people must become an essential part of family, municipal and national policy.

"Although it is right and glorious to incur risk, and to sacrifice life for public objects, it has always been felt that length of days is the measure, and that the completion by the people of the full term of natural existence is the groundwork of their felicity.

"Science, indeed, can scarcely apprehend all the results and all the modifications of society that would flow from the extension of life to its natural limit, nor perceive how all the violence, impurity, ignorance and innumerable diseases which now destroy men can be dispersed. But science offers no justification to despair. When all the great changes that have already been wrought . . . are considered, . . . the mind is involuntarily disposed to listen . . . to the voice of the great prophet.

'And the voice of weeping shall be no more heard, nor the voice of crying. There shall be no more thence an infant of days, nor an old man that hath not filled his days; for the child shall die a hundred years old.

'And they shall build houses and inhabit them; and they shall plant vineyards and eat the fruit of them. They shall not build and another inhabit; they shall not plant and another eat: for as the days of a tree are the days of my people, and mine elect shall long enjoy the work of their hands.'"

AN OUTBREAK OF Q FEVER IN EAST KENT

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Q FEVER was first recognised by Derrick (1937) in Queensland, Australia, as the result of his investigations of a febrile illness affecting abattoir workers in Brisbane. The disease can vary considerably in its intensity from patient to patient, but usually presents clinically as a short illness of sudden onset associated with severe headache, malaise, high swinging temperature, and profuse sweating. A few days after the onset a cough may develop, and radiography of the chest may show a picture resembling that of "virus" or "atypical" pneumonia. The proportion of patients with X-ray changes may vary widely from one outbreak to another. The usual duration of the illness is about 8–14 days, but in severe cases the illness may last up to a month or more.

The causal agent was isolated by Derrick (1937), identified as a rickettsia by Burnet and Freeman (1937), and named *Rickettsia burneti* by Derrick. As the clinical picture of Q fever is neither constant nor clinically readily distinguished from other fevers or pneumonias, the diagnosis has to be made on specific laboratory evidence consisting usually of the demonstration of a rising titre of antibodies to *R. burneti* during the course of the illness, together with, in some instances, the isolation of this organism from the blood during the fever or from the urine during early convalescence.

It is now known that Q fever has a wide geographical distribution; since its original occurrence in Australia evidence of the disease has been found in North and South America, Europe, and North Africa. The epidemiology of the disease, which is complex and variable, will not be described in detail here. Several reviews, such as those of Sidky (1950) and Dyer (1949), taken together with recent articles by Lennette and Clark (1951) and Huebner and Bell (1951), indicate its scope. In brief, *R. burneti* has been isolated from various sources in Nature: several ticks and their animal hosts have been shown to be infected; and dairy cattle, sheep, and goats may harbour the organism and excrete it in their milk, or they may contaminate their environment during parturition or by excreting the organism in various secretions and dejecta. It seems that man can be infected by the consumption of raw milk or by the

inhalation of dust or ærosols arising from places contaminated by infected animals, by their excreta, or by the processing of their tissues. The relative importance of any particular source or route of infection may differ considerably in different areas, as, for example, in North and South California (Lennette and Clark 1951, Huebner and Bell 1951), depending presumably, among other factors, on the particular size and nature of the animal population and on the occupations, hygiene, and residential habits of the people living in the same area.

Q fever has been identified in Great Britain: Stoker (1949) found serological evidence of infection in two R.A.F. men stationed in Wiltshire; and subsequently *R. burneti* was isolated from a patient in a small outbreak at the Royal Cancer Hospital, London (MacCallum et al. 1949). Epidemiological investigation of this outbreak led to the identification of foci of the disease in Kent and Devon (Marmion and Stoker 1950), and subsequently sporadic cases of the disease have been found in Glamorganshire, Gloucestershire (Manderson 1949), London, North Wales (Forbes 1950), Oxfordshire, Somerset, and Staffordshire (unpublished).

We describe here an explosive outbreak of Q fever, the first of its kind detected in this country, which affected students attending a college of art in East Kent.

THE OUTBREAK

The College of Art, Canterbury, is the regional centre for fine and applied art, industrial design, and architecture.

On June 12, 1950, an outbreak of illness was recognised among the students. In the main, the illness was mild and consisted of fever and headache. Two students had been admitted to hospital as suspected cases of enteric fever, and another was under specialist's observation at home for pyrexia of unknown origin. In all, 27 full-time day students and 1 caretaker developed the illness, with onsets falling between June 5 and June 15.

CLINICAL PICTURE

The illness varied considerably in severity from student to student but was of sudden onset in all. Rapidly developing fever was accompanied by severe headache, either frontal or on the crown of the head. Retro-orbital pain with photophobia was experienced by a number of the patients, and some of these showed injection of the conjunctivæ. Mild gastro-intestinal signs or symptoms—a dirty tongue, abdominal discomfort or nausea and, in a few instances, brief diarrhœa—occurred in more than half the patients. A transient stiff neck or pain in the neck muscles was experienced by more than a third of the patients, but Kernig's sign was negative in all of them. In only 5 of the 28 cases were there signs of lung involvement, and 1 of these (case 28) also had chronic bronchitis and silicosis. Most of the patients were treated at home, and consequently were not radiographed. Of the 5 members of the college who were radiographed, only 1 had evidence of pneumonia. In general the illness was more severe in persons aged more than 30. The symptoms are summarised in table I.

TABLE I—SYMPTOMS OF 23 SEROLOGICALLY PROVED CASES OF Q FEVER

Symptom	No. of patients showing symptoms
Pyrexia	23
Headache	21
Eye signs or symptoms	12
Mild gastro-intestinal symptoms	15
Stiffness of neck	11
Respiratory symptoms	5

ILLUSTRATIVE CASE-RECORDS

Case 3.—A man, aged 21, had pyrexia (102°F) with headache on June 10, 1950. A doctor was called on June 14 and diagnosed "a touch of the sun." The patient recovered on treatment of symptoms and returned to work on June 19. (Titre of 1/32 in the complement-fixation test to *R. burneti* on the 30th day of illness.)

Case 6.—A woman, aged 36, had pain in the right upper part of her chest on June 7 after a cold. She had pyrexia (99·8°F), pulse-rate 100, and severe headache. There were no physical signs in the chest. Pyrexia was settling with sulphadiazine therapy after 2 days, but anorexia, dirty tongue, constipation, and insomnia continued for 3 more days. On June 12, the patient was apyrexial and all symptoms had subsided. Nevertheless radiography on June 20 showed a patch of pneumonic consolidation in the upper lobe of the right lung. The opacity had resolved completely by July 4. (Titre of 1/128 to *R. burneti* on the 26th day of illness.)

Case 11.—A man, aged 20, had pyrexia, headache, retro-orbital pain, and general aching on June 9. He made an uneventful recovery on sulphathiazole and returned to work in 10 days. Clinically he resembled a case of "mild influenza." (Titre of 1/64 to *R. burneti* on the 29th day of illness.)

Case 12.—A man, aged 20, had fever, severe headache, soreness of eyes, and lassitude on June 5. When seen at the family doctor's surgery on June 8 he had pyrexia (103°F) and was sent to bed. There was a transient diarrhœa during the night of June 8. Pyrexia and abdominal discomfort continued, and he was admitted on June 10 to the infectious-diseases hospital, Ashford, as a possible case of enteric fever.

On admission he complained of moderate headache, retro-orbital pain, and photophobia. The vague abdominal discomfort persisted, and his temperature was 100·2°–101·4°F, pulse-rate 92, and respirations 26 per min. during the first 24 hours. There was some neck rigidity, and the cerebrospinal fluid (C.S.F.) was under slight pressure when tapped on June 10, but there was no increase in cell-count. There was no physical sign of lung involvement.

Progress.—The patient's temperature became normal on June 12. The most constant complaint was pain in the eyes and headache, which was at times severe. Cultures of blood, fæces, urine, and C.S.F. were all negative, and serological tests for the typhoid-paratyphoid group of organisms showed nothing of significance. A blood-count on June 10 showed a slight neutropenia. No febrifuge treatment was given, and the patient was discharged as fully recovered on June 21. (Recalled for serological examination 33 days after onset, the patient was found to have a titre of 1/256 to *R. burneti* in the complement-fixation test.)

Case 18.—A man, aged 20, was admitted to hospital on June 10, with 3 days' history of headache and backache. His temperature on admission was 103°F, pulse-rate 82, and respirations 20 per min. In spite of this there were no physical signs of illness except some doubtful "rose spots." The pyrexia continued for 4 days with a relatively slow pulse-rate of 68–100 during the acute stage of illness, and on June 14 his temperature and pulse-rate were normal and remained so. Sulphamerazine was given. The patient was discharged well on June 24. (Sera taken on the 11th and 37th days of illness showed an unchanging titre of 1/64 to *R. burneti*.)

Case 19.—A man, aged 20, had sudden pyrexia, headache, nausea, and constipation on June 7. Diaphragmatic pleurisy was diagnosed, and there were signs of fluid at the right base. Sulphamerazine was given and the patient fully recovered within 9 days. (Titre of 1/256 to *R. burneti* in serum collected 2 months after onset of illness.)

Case 28.—A man, aged 55, who had silicosis and chronic bronchitis, had a sudden onset of pyrexia, headache on June 6, and stiffness of the neck. The illness was diagnosed as an "influenzal" exacerbation of the chronic chest condition. The pyrexia was remittent for 10 days, but the patient recovered by July 24. (*R. burneti* titre was 1/8 on the 3rd day of illness and subsequently rose to 1/64 by the 28th day.)

LABORATORY INVESTIGATIONS

Examination during the early stages of the illness was possible in 6 cases. Investigations were undertaken on these 6 patients to exclude enteric and undulant fever by the culture of blood, urine, and fæces, and by Widal tests of serial specimens of blood. Glandular fever was excluded by Paul-Bunnell tests and examination of blood films.

TABLE II—TOTAL AND DIFFERENTIAL LEUCOCYTE-COUNTS DURING FIRST WEEK OF ILLNESS IN 6 SEROLOGICALLY PROVED CASES OF Q FEVER

Case no.	Day of illness	Total leucocyte-count (per c.mm.)	Differential leucocyte-count (%)				
			Baso.	Eosino.	N. Poly.	Lymph.	Mono.
2	3	2700	—	1	48	48	3
9	4	3500	—	—	49	50	1
5	4	3700	1	—	44	52	3
8	6	2700	—	—	49	49	2
15	6	4000	—	—	45	50	5
18	6	6700	—	—	74	21	5

Blood samples taken from these patients revealed one constant and noteworthy feature—a moderate neutropenia. The cell-counts ranged from 2700 to 4000 per c.mm. (polymorphs 44–49%) (table II). Samples taken from these and other patients after the first week of illness showed no abnormality.

Later, when it was realised that the outbreak might be one of Q fever, samples of sera taken in the acute and convalescent phases from the 6 patients were tested for complement-fixing antibodies to *R. burneti*. Sera were tested for antibodies to the soluble antigens of influenza viruses A and B, and to the psittacosis-ornithosis group antigen, and for agglutinins to *Strep. M.G.* and for cold hæmagglutinins to human group-O red cells. The technique used in the complement-fixation test with *R. burneti* was that described by Marmion et al. (1951) using an antigen prepared from the Henzerling strain of *R. burneti*. Table III shows the results obtained in the 6 patients, and it will be seen that 5 of the patients (cases 5, 8, 9, 10, and 28) showed rising titres to *R. burneti*. The 6th patient (case 18) was bled at a stage of the disease when presumably the level of antibody had already reached its maximum. None of the sera from these patients showed any fixation against the typhus vaccine used as a control antigen, and it was concluded that the antibody present was specific for *R. burneti*. The negative results in the other serological tests excluded influenza viruses A and B, viruses of the psittacosis-ornithosis group, and the so-called "virus" of atypical pneumonia as a cause of the outbreak.

Serological investigation of other students who had been ill was largely retrospective, and blood specimens taken 24–150 days after the onset of their illness were examined for *R. burneti* antibody with positive results.

TABLE III—SEROLOGICAL FINDINGS

Case no.	Day of disease	Complement-fixation tests				Agglutination	
		Influenza virus soluble antigen		*R. burneti*	Psitta-cosis-ornithosis	*Strep. M.G.*	Human group-O red cells at 4°C
		A	B				
5	3	<4	<4	<8	—	<10	<4
	11	<4	<4	32	<16	<10	<4
	24	<4	<4	128	<16	<10	—
8	4	—	—	<8	—	—	—
	11	<4	<4	32	<16	<10	—
9	3	<4	<4	8	—	<10	<4
	11	<4	<4	64	<16	<10	<4
	24	<4	<4	64 ±128	<16	<10	—
10	8	<4	<4	32	—	<10	—
	24	<4	<4	256	<16	<10	—
18	11	<4	<4	64	<16	10	—
	37	—	—	64	—	—	—
28	3	—	—	8	—	—	—
	28	—	—	64	—	—	—
Mr. A	6	<4	<4	<8	—	<10	<4
	21	<4	<4	32	<16	<10	—

Of the 28 persons who complained of symptoms 23 had an elevated antibody titre; 1 was negative, showing only partial fixation at a dilution of 1/8 of his serum (case 25); and blood samples were not obtained from 4 patients.

As most of the patients had had a mild illness, it seemed probable that some of the other students, who had not been ill, might nevertheless show some serological evidence of subclinical infection. Accordingly a group of 20 full-time students, who volunteered to be bled, were tested. Of these 20, 9 (45%) had titres to *R. burneti*, which were lower than those obtained in the patients. Fig. 1 shows the distribution of titres in the 20 patients and the 20 volunteers bled at comparable times after the outbreak. These findings in the volunteers suggest that unapparent infections were about three times as common as those clinically manifest. However, Canterbury is situated in an area of Kent where sporadic cases of Q fever have already been found, and serological investigation of blood-donors from Canterbury and other parts of Kent has shown that 1–4% have low titres suggesting past exposure to *R. burneti*. Although this level of positive reactions is well below that obtained in both the sick students (96%) and the volunteers (45%) in the college, the possibility of error due both to the selection involved in volunteering and to residual antibody unconnected with the present outbreak must be borne in mind in interpreting the results obtained with the volunteers.

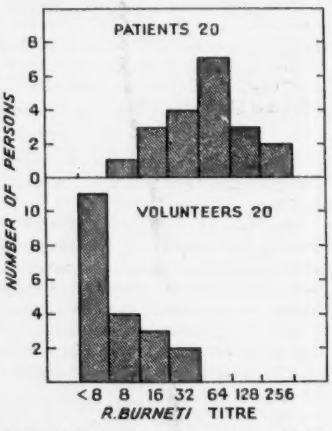

Fig. 1—Distribution of complement-fixing antibodies to *R. burneti* in sera of 20 patients with Q fever and 20 symptom-free volunteers determined at a comparable period after the outbreak.

In general, the serological findings—the rising titres observed in the 5 patients and the high proportion of positive reactions in the convalescent sera of other patients and in the sera of volunteers—indicate that the outbreak at the college was one of Q fever, although no attempt could be made to isolate the rickettsia from any patient, because the outbreak was diagnosed retrospectively.

EPIDEMIOLOGY OF THE OUTBREAK

The College of Art, Canterbury, comprises a main building, containing a number of studios and offices, a separate school of architecture, and a printing and cabinet-making department (fig. 2). The students attached to any of these departments mingle with those from others, and all come into the main building. The students are drawn from all over Kent, but most of them come from East and Mid Kent. The population of the college was 185 full-time students (112 males and 73 females), 15 full-time teaching and clerical staff, 18 part-time staff, 4 caretakers and cleaners, and 97 students attending night school. Most of the full-time students were between 18 and 30 years of age. The outbreak was recognised on June 12, 1950, when the deputy principal of the college, associating in his mind the news that a student had been admitted to a local infectious-diseases hospital with the fact that some students were absent with feverish headache, communicated with the medical

officer of health of Canterbury. To gauge the size of the outbreak the medical officers of health of the home districts of all absent students were then asked to ascertain the reason for absence and to describe the symptoms and signs of any illness. Further clinical information was obtained from family doctors, who also gave valuable coöperation in collecting blood samples and otherwise.

The result of the inquiries showed that 27 of the full-time students and 1 caretaker had become ill between June 5 and June 15. None of the full-time teaching and clerical staff or part-time staff was affected, and a later inquiry among a sample of 30% of the night-school students revealed only 2 persons who might clinically have had Q fever. Serological examination of both these persons was negative. The general practitioners in Canterbury were asked to report any similar illness in the population of the town in addition to that occurring in college students. (Particular attention was paid to the houses and shops next to the college.) No cases were reported, and the outbreak appeared to be confined to the college. There was, however, one exception. Mr. A, a resident of a nearby coastal resort, was admitted to the Kent and Canterbury Hospital with an illness diagnosed as atypical pneumonia, which started on June 10 at the height of the college outbreak. His illness proved, on serological examination, to be Q fever (table III). He worked in an insurance office some 50 yards from the college and was in the habit of parking his car at the rear of the main college building (fig. 2).

Fig. 3 shows the incidence of cases in time. The outbreak was a sharp and short-lived episode, and the general distribution of cases was consistent, in view of the variability (14–25 days) of the incubation period of Q fever, with a brief exposure of 1 or 2 days to some source of infection rather than with case-to-case spread of the disease. The attack-rate was 13·5% (28 of the 204 persons, day students and full-time staff, who were at risk). The night students and part-time staff have not been included in this calculation. Of the 27 clinical cases of Q fever among students, 22 were in males and 5 in females. This proportion of males (80%) contrasts with the ratio of males and females for the full-time

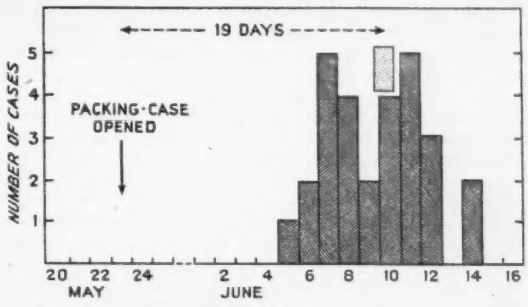

Fig. 3—Incidence in time of cases of Q fever among students and staff of College of Art. Hatched area, onset of Mr. A's illness.

students as a whole, of whom 60% were male ($\chi_1 = 4{\cdot}8$ $0{\cdot}02 < P < 0{\cdot}05$).

In an effort to find the source of the infection an inquiry was made of 154 of the 185 full-time students about their patronage of certain local restaurants, their use of a "tea club" situated in the basement of the college, and their attendance at various lectures and studies held in different parts or buildings of the college. This information was analysed to see if any particular group in the college, or if any particular activity, was associated with an unduly high incidence of infection compared with the college as a whole. Only one group of students, the third-year architects, had a case-rate above the general level, and no reason could be found for this difference.

At the same time staff and students were questioned about their contact with such known sources of Q fever as cattle, sheep, and goats, and their products or excreta. No evidence was found of contact of any particular group in the college, or of the introduction into the college of any animals or animal products, such as hides or furs. The fact that cases occurred in all groups of students suggested that no particular visit by any one group—e.g., to a farm or factory—was responsible for the outbreak. Students did not report any undue prevalence of insects or insect bites.

R. burneti is known to occur in the milk from some dairy cows, and so the possibility that the outbreak was milk-borne was considered. *R. burneti* was, in fact, isolated from the bulked supply of raw milk to one of the dairies which supplied milk, after pasteurising it, to the college, and to various restaurants frequented by the students. It was felt that, even if some rickettsiæ had survived pasteurisation, their number would probably not suffice to cause an outbreak of the observed size. In addition, the same milk was supplied to many other persons in Canterbury, and investigation of a sample of this population did not reveal any suspicious illness among them.

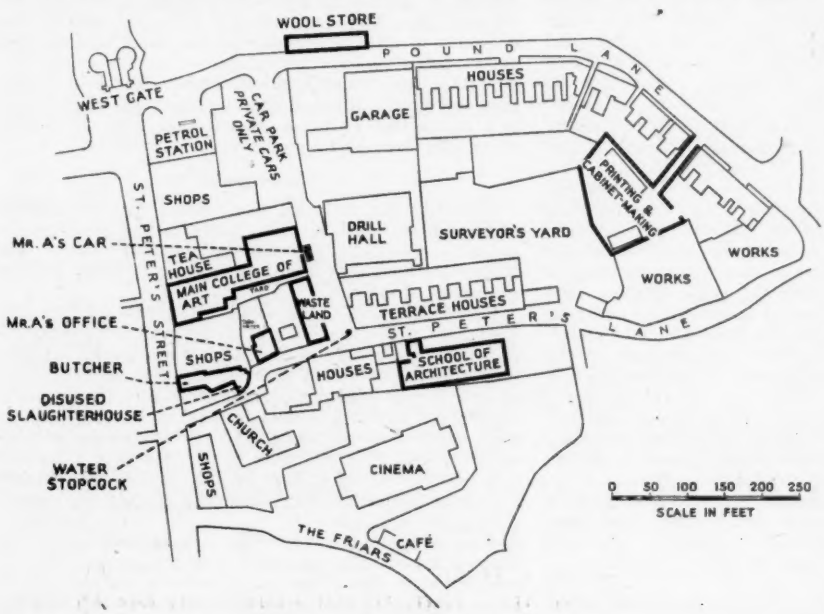

Fig. 2—Plan of area involved in outbreak.

The immediate surroundings of the college were inspected for likely sources of infection. Only two possibilities were found—a disused slaughterhouse at the back of a butchers' shop about 50 yards from the college, and a wool store about 80 yards from the college (fig. 2). No slaughtering had taken place at the slaughterhouse since 1943, but towards the end of May or early June, 1950, the place had been swept and cleaned in preparation for some repairs to the walls, which were eventually done on June 25. The rubbish from this cleaning was taken straight from the slaughterhouse and not deposited on the waste ground at the back of the college. The butcher doing the cleaning did not become ill, and a sample of serum taken a year later did not show *R. burneti* antibodies. An outbreak of Q fever resulting from contaminated sheep's wool has been described by Sigel et al. (1950); so the wool store was also investigated. Wool sales had taken place on May 12, and baled wool had been moved in and out of store before and after that date. Full inquiries disclosed no incident near the college which might have discharged dust from the wool. There was no evidence of illness among the wool merchants' staff, but such personnel would be likely to be already "salted." The prevailing wind in May is from the college to the store.

Examination of water-supplies did not reveal contamination, but an extensive infestation with greenbottle fly (*Lucilia sericata*) was found round a stopcock about 30 yards from the college (fig. 2).

Another possible source of infection was packing-straw. Accordingly the invoices of all goods coming into the college for two months before the outbreak were examined for items packed in straw. Very few goods had been packed in straw. In these instances the firms supplying them were asked to examine their records for illness among their employees 14–25 days after the packages had been made up and dispatched. Here again the results were negative.

Several months after the outbreak, however, further questioning of one of the students revealed an incident which may possibly have been the cause of the outbreak. About May 23 an old packing-case had been removed from the top of a cupboard where it had been stored for some years and had been opened by a member of the staff and one of the students in a studio in the main building. The intention was to break up the box and use the wood to make a smaller box to send a statue to an educational institute in London. When the lid was removed, the contents were found to be wood-shavings, paper, and straw—the usual debris of packing material. The straw was unpleasantly "mouldy" and "dusty"; so it was decided to continue the unpacking and breaking up of the box in the open air. The box was removed to the ground at the rear of the main building (fig. 2), where it was broken up, and the old straw was put in dustbins standing outside the windows of the cellar "tea club." Moving the case meant carrying it through the centre corridor of the main building used by most of the students attached to the college and past the top of the stairs leading to the basement "tea club." The dustbins and the area where the case was broken up were near the place where Mr. A parked his car (fig. 2).

Further inquiry at the institute in London showed that the reconstructed case had arrived from Canterbury about June 23. It contained a statue packed in paper, wood-shavings, and straw. Apparently this packing-material was not that which had originally been present in the packing-case but some other which had been substituted when the statue was dispatched. The case was unpacked between June 24 and June 30 by 2 employees of the institute—a woman and a man. On July 9, the woman became ill with headache which lasted for 4 or 5 days. This was accompanied by malaise, but the patient had no shivering or sweating. She did not take her temperature. The sera of the 2 employees collected on Nov. 15, 1951, some 20 weeks after the unpacking of the case, were tested for complement-fixing antibodies to *R. burneti*. The woman's serum showed fixation at a dilution of 1/8 with *R. burneti* but not with typhus vaccine control antigen, and the man's serum was negative. This low titre could have resulted from an attack of Q fever in July, because the woman's illness was very mild, and the titre is of the same order as that seen in some of the patients and volunteers at the College of Art (fig. 1). On the other hand, it may merely have been a residual titre from some past infection.

Inquiries were also made to see if other persons handling the original straw from the packing-case had been ill. The 2 persons at the Art College, a woman and a man, who originally unpacked and broke up the box, did not complain of illness at the time when the outbreak was first investigated. The woman had a complement-fixing antibody titre of 1/8 to *R. burneti* and, on being questioned again, said she had had a mild headache at the time of the outbreak. The man did not have any symptoms and was serologically negative when tested 8 months later.

Inquiries were also made about absence due to sickness among corporation dustmen responsible for emptying the dustbins where the straw had been placed. No record of any suspicious illness was found.

ATTEMPTED ISOLATION OF *R. burneti* FROM DUST

In view of the general characteristics of the outbreak and the subsequent suggestive epidemiological findings concerning the packing-case, it seemed possible that the outbreak was dust-borne in origin. Consequently several attempts were made to isolate *R. burneti* from dust collected in the college at the "tea club," from ledges in the corridor of the main building, and from the inner surface of the extraction fan in the roof of the studio where the unpacking of the case had begun. The packing-case itself was still available at the institute in London and was removed to an isolation cubicle at the Virus Reference Laboratory at Colindale and unpacked and broken up in the vicinity of a modified Bourdillon-type air-sampler. The dust samples from the college and contents of the air-sampler plates were shaken with broth and, after light centrifugation and treatment with penicillin, were inoculated intraperitoneally into guinea-pigs and mice. None of the animals inoculated showed any serological evidence of infection with *R. burneti* when they were bled a month after inoculation.

DISCUSSION

Clinically the outbreak was notable for the mildness of the illness, which in many patients had been dismissed as "sunstroke," "influenza," and the like. The laboratory findings conformed to those of other cases or outbreaks of Q fever.

Epidemiologically, the explosive nature of the outbreak, the high proportion of unapparent infections, and the greater incidence of disease in males are of interest.

The identification of the packing-case as the source of infection is perhaps open to debate. The evidence implicating it is: (1) that it was unpacked about 19 days before the outbreak; and (2) that about 19 days after contact with the case or its contents 2 persons not members of the College of Art—Mr. A, who parked his car at the back of the college (fig. 2), and the woman who unpacked the case on its arrival in London—developed either Q fever, or an illness which could have been Q fever. The outbreak had the general characteristics of a dust-borne or air-borne incident, and no other evidence of the importation of potentially infected material into the college was found. A somewhat

similar outbreak, possibly due to packing-straw, has been described by Wegmann (1948) in Switzerland, in which 19 of 75 persons unpacking a printing-press from Cincinnati developed Q fever 9–23 days later.

On the other hand, of the two persons mainly concerned with opening and breaking up the box at the College only one had mild Q fever and a low serological response in contrast to the 27 students whose contact with the case and its dust was presumably less intense.

Little importance can be attached to the negative results in the attempt to isolate the rickettsia from the packing-case. The packing-material in the case was mainly fresh; and the method used, the collection of dust on slit-sampler plates and inoculation of guineapigs, was probably not very sensitive.

Straw is sometimes considered, among other possibilities, as a source of infection in outbreaks of Q fever, as it has been in this incident, but the way in which it becomes contaminated is not clear. It surely must be rare for the "clean" straw used in packing to be obviously or grossly contaminated with animal discharges or excreta. It is, perhaps, more feasible that dust from heavily contaminated farm environments should settle on the straw while it is being stored or baled on the farms and be liberated into the air later. Another possibility is that insects present in the straw may contaminate it with their excreta. Published reports have implicated only ticks as being infected in Nature, although other parasites can be infected in the laboratory—e.g., body lice and mouse fleas (Weyer 1949) and possibly the house-fly, *Musca domestica* (Philip 1948). It would therefore not be unreasonable to investigate other insects for evidence of infection. Robbins et al. (1946) have commented on the prevalence of mites in the straw and hay associated epidemiologically with outbreaks of Q fever among troops in Italy. So far as we are aware, only one species of mite, *Liponyssus bursa*, has been tested (with negative results) for its ability to harbour or to transmit *R. burneti* (Smith et al. 1939). In the present outbreak mites (not further identified) and the tissues of two mice which were living in the material in the packing-case were tested in guineapigs with negative results. The source of the straw in the present outbreak and how it might have been contaminated could not be ascertained.

SUMMARY

The clinical, laboratory, and epidemiological findings in a small outbreak of Q fever in an art college are described.

Twenty-seven students and 1 member of the staff became ill in an outbreak lasting 10 days. The illness was mild and was identified as Q fever on serological grounds.

Epidemiological investigations excluded case-to-case spread; contact with cows, sheep, and goats; visits to potentially infected environments; consumption of raw milk; and bites of insects. Other investigations suggested that the opening of a packing-case, and the removal of its straw, some 19 days before the outbreak, may have been responsible.

Thanks are due to Dr. I. B. Morris, director of the pathological department, Kent and Canterbury Hospital, and Dr. F. O. MacCallum, director of the Virus Reference Laboratory, Colindale, for their help and advice in the investigation of this outbreak. Grateful acknowledgment is also made of the willing coöperation given by Mr. A. Moody, A.R.C.A., principal of the College of Art, and his staff and students; by the medical officers of health, general practitioners, and the staffs of various public-health departments who visited the patients in their homes; and by Mr. T. L. Martin, senior sanitary inspector, Canterbury.

References at foot of next column

RHESUS GROUPING WITH CELLS SUSPENDED IN SALINE SOLUTION AND WEAK ALBUMIN-AGGLUTINATING ANTISERA

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IN view of the scarcity of strong saline-agglutinating antisera and the relative abundance of the weak albumin-agglutinating variety it was considered desirable to search for a method by which the latter could be used for routine rhesus grouping. The method evolved avoids the trouble of suspending each sample of cells in albumin, so that the same suspensions can be used for both the A, B, O, and rhesus groupings, with a consequent saving of time in an emergency, or when large numbers of bloods have to be grouped.

Suitably absorbed serum containing weak albumin-agglutinating antibody is freeze-dried, and the resulting powder dissolved in, and made up to its original volume with, 20% bovine albumin. It is then used for rhesus grouping in tubes in exactly the same way as saline-agglutinating antibody. Examples of this improved preparation have been used in parallel with saline-agglutinating antisera in this laboratory in 300 instances, and the two methods never failed to give identical results.

This preparation can also be used on a slide for rapid rhesus blood-group determination, when we have found the following technique to be satisfactory:

A drop of the undiluted blood, or 50% cells in saline solution, is added to a drop of the modified serum on a slide. The two are mixed either by rocking the slide, or with a glass rod, and the test is read in five minutes. If the blood is fresh, the positive cells show massive agglutination.

As is usually found in blood-grouping work, results are less clear-cut with old blood samples.

The serum works well on blood from a finger-prick and can be used at the bedside or for the rapid screening of blood donors before donation. Since agglutination is definite after five minutes, and as no fallacies have so far been discovered, this test is suitable for use by those unaccustomed to serological techniques. Its use should lead to more widespread rhesus grouping of patients before transfusion, with a consequent diminution in the demand for rhesus-negative blood.

We find that sera treated in this way give satisfactory results, whether the original samples gave a positive Diamond slide test or not, and so far none of the false negative results, which commonly occur when weak sera are used for the slide test, have been seen.

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THE EFFECT OF ADRENOCORTICOTROPIC HORMONE ON THE DIURETIC RESPONSE TO WATER IN PANHYPOPITUITARISM

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WHEN a normal person drinks a litre of water, dilution of the blood leads to cessation of the secretion of antidiuretic hormone (A.D.H.) by the neurohypophysis. As the circulating hormone is removed, renal tubular absorption of water diminishes, the urine-flow rising steadily until it exceeds 10 ml. per minute. At the same time the concentration of urinary chloride diminishes. This response begins after a delay of about thirty minutes, and then more than half the water drunk is excreted in an hour.

This diuretic response to water is diminished or absent in panhypopituitarism. This may be partly due to lack of growth hormone (White et al. 1949), but the complete absence of diuresis in severe adrenal deficiency shows that it is lack of the corticotropic hormone (A.C.T.H.) that is mainly responsible.

The possible reasons for the failure of this response in adrenal deficiency have been discussed by Levy et al. (1946), Gaunt et al. (1949), and Slessor (1951), and may be summarised as follows:

The kidney might fail to excrete more urine either because of the much smaller filtration of water at the glomerulus or because tubular absorption was not diminished in response to the water load of the body. This in turn might be the result of persistence of A.D.H. in the blood-stream because (1) the water might be slowly absorbed from the gut or rapidly transferred to extravascular spaces with the result that there is less hæmodilution than normal; or (2) the osmoreceptors controlling the secretion of A.D.H. (Verney 1946) might not be sensitive to hæmodilution; or (3) the hormone might not be removed from the blood-stream after its secretion has ceased.

It is possible that the renal tubules might be abnormally sensitive to A.D.H., in which case the diuretic response should appear after a longer interval, when the hormone has been removed in the normal manner.

It is also possible that other antidiuretic substances are present in the blood.

On the other hand, the tubules might reabsorb more water not as the result of any humoral influence but because of some inherent abnormality.

Slessor and Thorn (1950) have shown that cortisone will restore the diuretic response in Addison's disease. Oleesky and Stanbury (1951) found that oral cortisone was effective.

In the course of the present work it was found that A.C.T.H. will restore the diuretic response in panhypopituitarism. Cortisone was effective in this condition and in one case of Addison's disease. An opportunity was thus provided to investigate the reasons for the absence of this response.

MATERIAL

Six patients with panhypopituitarism and one with Addison's disease were studied. The details are summarised in table I. No treatment other than with A.C.T.H. was given while these observations were being made.

METHODS

The diuretic response to water was tested by asking the patient to empty the bladder every ten minutes after drinking a litre of water in fifteen minutes. Owing to the contamination of A.C.T.H. (Armour) by vasopressin, the diuretic response has to be tested when the temporary antidiuretic effect of the last injection has ended (fig. 1). This effect does not last more than six hours. Urinary chloride was estimated by the Volhard-Harvey method.

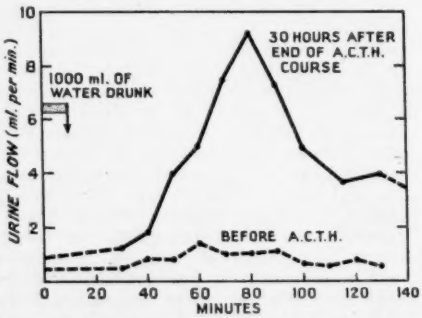

Fig. 1—Diuretic response to ingested water in hypopituitarism (case 4).

Immediately before drinking, and again thirty-five minutes after all the water had been drunk, venous blood samples were drawn without stasis into heparin tubes. Plasma-proteins were estimated by the copper-sulphate specific-gravity method, plasma-sodium by the method of Albanese and Lein (1948), and plasma-chloride by Volhard's method. The freezing-point of the plasma was found with a modified Beckmann thermometer. Eosinophils were counted by the method of Randolph (1949).

In cases 2, 3, 4, 5, and 7 the glomerular filtration-rate was estimated by the inulin clearance, the mean of three periods being taken and a constant infusion being given intravenously after a priming dose. The bladder was catheterised and washed out with saline solution in cases 3, 4, 5, and 7. Inulin was estimated by the method of Corcoran and Page (1939). In case 1 the urea clearance was estimated instead of the inulin clearance.

Serum antidiuretic substance was estimated by a modification of the method of Birnie et al. (1949), groups of three rats being used, hydrated with 5 ml. of water per 100 g. of body-weight by stomach-tube for three

TABLE I—DETAILS OF CASES INVESTIGATED

Case no.	Sex	Age (yr.)	Ætiology	B.M.R. (Aub-DuBois)	Excretion of 17-keto-steroids (mg. per 24 hr.)	Robinson Kepler test		Hypoglycæmia unresponsiveness	Dosage of A.C.T.H. (Armour) (I.M. 6-hourly) or cortisone
						Proc. I.	Coeff.		
1	M	36	Chromophobe adenoma	−29	1·9	..	..	+	20 mg. × 10
2	M	61	Do.	−32	4·6	..	..	..	25 mg. × 9
3	F	24	Postpartum hæmorrhage	−34	6·2	Neg.	..	+	25 mg. × 10
4	F	39	Do.	−28	1·6	+	6	+	Do.
5	F	40	Do.	−48	2·6	+	14	+	Do.
6	F	45	Chromophobe adenoma	−20	4·0	+	31	+	Also cortisone 150 mg. by mouth on another occasion A.C.T.H. (Crookes's) 25 mg. × 12 followed by A.C.T.H. (Armour) 25 mg. × 6
7	F	44	Addison's disease	−4	1·2	+	8	..	Cortisone 500 mg. I.M. in 6 days

doses, and then injected intraperitoneally with 1 ml. of serum, 1 ml. of physiological saline solution, or 2 milli-units (mU) of 'Pitressin' in 1 ml. of saline solution. The antidiuretic activity is the difference between the percentages of the water load excreted in ninety minutes by the test group and by the control (saline) group of rats.

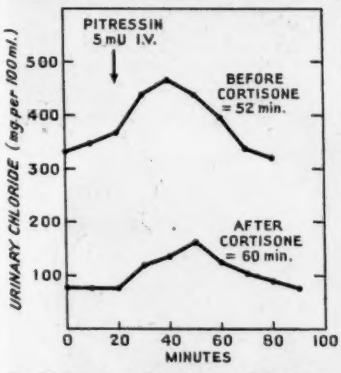

Fig. 2—Duration of response to intravenous pitressin in Addison's disease (case 7).

Sensitivity to pitressin was determined by injecting a small dose intravenously after a water load and taking the time for the urine-flow (measuring the volume every ten minutes) to return to its initial level. Where these volumes were very small, it was more convenient to estimate the chloride concentration in each specimen, the action of the hormone being to increase the urinary chloride concentration without increasing the absolute output (Chalmers et al. 1951) (fig. 2).

RESULTS

Diuretic Response

In every case of panhypopituitarism the effect of the course of A.C.T.H. was to increase the diuretic response to water so that it fell little short of normal when measured by the volume excreted between 30 and 90 minutes after ingestion (fig. 3). Corresponding falls of urinary chloride levels were observed at the same time.

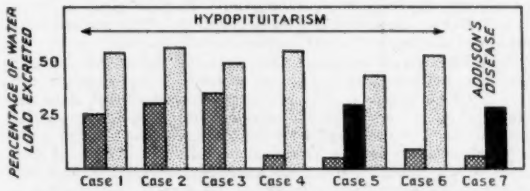

Fig. 3—Percentage of water load (1000 ml.) excreted 30–90 min. after ingestion in hypopituitarism (cases 1–6) and Addison's disease (case 7): hatched columns, before A.C.T.H.; stippled column, after A.C.T.H.; black column, after cortisone.

It is therefore clear that treatment does not merely have a diuretic effect; it restores the flexibility of tubular function which enables the body rapidly to excrete extra water alone, when necessary.

This effect was brief, lasting only for a day or two, though some increased appetite, activity, and sense of well-being, which were noted in every case, persisted for several months. Possibly this explains why Robertson (1951) did not observe more than a slight effect of A.C.T.H. on water diuresis in a case of panhypopituitarism.

In all the present cases a significant fall in circulating eosinophils was observed during treatment.

Reasons for Abnormality

Fig. 4 compares the glomerular filtration-rates in the present cases with the diuretic responses before and after treatment. Very large changes in the response may be associated with only slight increases in glomerular filtration-rate; hence it is evident that they are brought about largely by changes in tubular reabsorption.

The failure of the diuretic response is not due to the absence of hæmodilution (table II). It has also been shown that the response does not occur after intravenous water (Levy et al. 1946).

Fig. 2 compares the responses in case 7 to 5 mU of pitressin intravenously before and after cortisone. After treatment, when the diuretic response to water was greater, the hormone was not inactivated more rapidly than before, and the renal tubules were no less sensitive to its action. Moreover, if the tubules were abnormally sensitive to A.D.H., the diuretic response to water would be delayed but normal in all other respects. Such a response was not observed in any of our cases.

It has been suggested (Lloyd and Lobotsky 1950, Slessor 1951) that the increased titre of antidiuretic substance in the serum of patients with adrenal deficiency, detectable by rat assay and believed to originate in the neurohypophysis, may be responsible for the absence of the diuresis. Serum from case 1, taken just before he drank a litre of water, was antidiuretic, its activity corresponding to that of 2 mU of pitressin per ml. On this occasion the patient (maintained on thyroid extract and testosterone some months after a course of A.C.T.H.) showed an almost normal diuretic response. On the other hand, serum from case 4 showed no antidiuretic activity before treatment, when the diuretic response was absent. It therefore seems unlikely that this antidiuretic substance can be responsible for the absence of diuresis in any of these cases. This does not, however, rule out the possibility that the secretion of A.D.H. is not abnormally maintained, for the minimum needed to inhibit a diuresis is too small to be detectable in the blood by any of the present methods of assay.

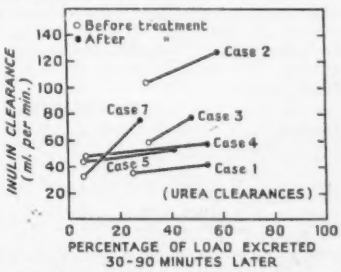

Fig. 4—Glomerular filtration-rates and diuretic responses in hypopituitarism (cases 1–5) and Addison's disease (case 7).

Salt depletion, which is known to reduce the diuretic response to water (Baldes and Smirk 1934) cannot be the cause of this in adrenal deficiency, for large doses of salt and deoxycortone acetate do not restore it. In case 7 a response was obtained after treatment with cortisone, though the plasma-sodium level fell. In none of the other cases was the plasma-sodium level below normal.

It therefore seems that the failure of the diuretic response in panhypopituitarism and adrenal deficiency is due to failure of the tubular reabsorption of water to decrease in response to the ingestion of water. This may be due to an abnormality of the tubules, but the possibility that the osmoreceptors are also defective and do not respond to hæmodilution, so allowing the secretion of A.D.H. to continue, cannot be excluded.

Whether the defect lies in the renal tubules or in the osmoreceptors, or in both, cortisone will repair it and so enable a normal diuretic response to occur. In panhypopituitarism stimulation of the adrenal cortex by A.C.T.H. has the same effect.

TABLE II—CHANGES IN PLASMA 35 MINUTES AFTER DRINKING 20 ML. OF WATER PER KG. OF BODY-WEIGHT IN 15 MINUTES

Subjects	Average percentage change in			
	Proteins	Sodium	Chloride	Depression of freezing-point
Cases 4, 5, and 7 before treatment	−8	−8	−5	+6
Cases 4, 5, and 7 after treatment	−9	−4	−4	+5
10 normal persons ..	−4	−4	−4	+6

SUMMARY

The diuretic responses to water in six cases of panhypopituitarism were studied before and after a short course of A.C.T.H.

A.C.T.H. restores the response in this condition.

Cortisone is also effective, and is effective in Addison's disease.

The absence of the response is due to failure of the tubular reabsorption of water to decrease.

This does not result from a failure of hæmodilution after drinking, from delayed destruction of antidiuretic hormone, from increased responsiveness to this hormone, from the action of other detectable antidiuretic substances, or from salt depletion.

The absence of the response must therefore be due to defective function either of the osmoreceptors or of the renal tubules, or to both these causes.

We wish to thank Prof. P. B. Ascroft, Dr. G. E. Beaumont, Prof. A. Kekwick, and Dr. J. Smart for permission to study their cases, and Professor Kekwick and Dr. C. A. Keele for their interest and help. Mr. G. L. S. Pawan, of the department of medicine, gave us valuable assistance. For the estimations in table I we are indebted to the S.A. Courtauld Institute of Biochemistry.

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GAS CYSTS OF THE INTESTINE WITH PNEUMOPERITONEUM

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Gas cysts of the intestine, or pneumotosis cystoides intestinalis as it is sometimes called, is rare but has often been recorded and thoroughly investigated. The published reports were reviewed by Jackson (1940), who collected 171 cases and added 1 of his own. Gazin et al. (1949), reporting a case diagnosed preoperatively by radiography, stated that at least 17 other cases had been published since 1940. In most cases the condition has been found unexpectedly at operation or post mortem, the symptoms present often being due to an associated peptic ulcer or other intestinal disease.

The following case is of interest because of the preoperative finding of pneumoperitoneum by radiography. Possibly in the absence of clinical signs of perforated bowel this finding may be pathognomonic of gas cysts.

CASE RECORD

A woman, aged 55, was sent to hospital by her doctor on Oct. 17, 1950, for a barium meal because she was complaining of abdominal pain, vomiting, and flatulence. She gave a history of having experienced epigastric pain for twenty-four years, with aggravation at times of worry. The pain came on about three hours after meals, but latterly had become continuous, sometimes for several days at a time. In the past few months she had vomited almost daily, and one of her main complaints was of repeated eructation of wind; at times this was most distressing, and she never seemed to be free from it; she also passed an undue quantity of wind per rectum. At the age of 38 a peptic ulcer had been diagnosed, but a barium meal did not reveal any abnormality. At the age of 51 a second barium meal showed a normal stomach but a spastic duodenum. A gall-stone was seen lying in the gall-bladder, and cholecystectomy was advised; but the patient refused, and continued with her diet, which seemed to benefit her at times.

Radiograph of pneumoperitoneum associated with intestinal gas cysts. Note gas beneath both sides of the diaphragm and large space between it and the liver.

Radiography.—At preliminary fluoroscopy a pneumoperitoneum was found and the presence of gas in considerable quantity under both sides of the diaphragm was confirmed by radiography (see figure). The liver was considerably depressed, as is usual with a pneumoperitoneum, and between it and the diaphragm gas-filled coils of bowel were seen. Since it was thought that chronic perforation might be present, it was considered inadvisable to administer a barium meal, and the stomach was therefore not radiographed. The patient was admitted for further investigation and treatment.

Condition on Admission.—She had obviously lost weight but was neither dehydrated nor anæmic. Her temperature was 98°F, pulse-rate 100, and respirations 25 per minute. Her abdomen was slightly distended and gave a tympanitic note all over, with loss of liver dullness; it also showed signs of erythema ab igne. There was slight tenderness to the right of the umbilicus but no guarding or rigidity, and the abdomen moved well on respiration. A succussion splash was obtained, and the impression gained of fluid moving from one side of the body to the other.

After twelve hours the patient showed no change in physical signs and gave no evidence of having had a perforation. At that time no satisfactory explanation could be given for the pneumoperitoneum, and laparotomy was decided on.

Laparotomy was performed through a right paramedian incision. When the peritoneum was incised gas escaped. There was no free fluid and no evidence of peritonitis. The stomach was enormously dilated, with the greater curve well down in the pelvis; it contained about 2 pints of fluid and a lot of air. At the pylorus was a hard mass as large as a small fist and involving the first part of the duodenum; there being no evidence of malignancy, it seemed to result from a chronic ulcer causing pyloric stenosis. Between the liver and the diaphragm was a gap of several inches. After delivery of the stomach, the first 4 or 5 feet of jejunum and the third part of the duodenum were seen to be studded with gas cysts, which were more numerous in some areas than in others and varied in size from $^1/_8$ to $^1/_2$ in. in diameter. Most of them, however, were small rather than large, with the larger ones lower down the bowel. The jejunal mesentery also contained small quantities of gas in places. The stomach, ileum, and large intestine had no cysts. A partial gastrectomy was performed with prepyloric section of the stomach, leaving the ulcer in situ. A loop of jejunum was selected relatively free from cysts about 10 in. distal to the duodenojejunal junction, and an antecolic anastomosis was performed.

Progress.—The patient made an uneventful convalescence and was discharged on the fourteenth postoperative day. Eight months after operation she was symptom-free and had

gained over a stone in weight. Radiography showed no evidence of a pneumoperitoneum and little gas in the intestine. The liver had returned to its normal position below the right diaphragm.

DISCUSSION

There has been considerable discussion about the ætiology of gas cysts of the intestine, but no hypothesis has been generally accepted. Four main ones have been advanced. A neoplastic origin has been discounted on the grounds of lack of histopathological proof and the observation at a second operation that the cysts may spontaneously disappear. The view that the cysts are infective is rendered doubtful by the failure to culture bacteria in most cases. Analysis of the gas has shown the presence of oxygen, a finding not in keeping with a bacterial origin. The microscopical picture also does not suggest an infection. Masson (1925) suggested that the gas is derived from chyle as the result of chemical interaction with acid products of intestinal fermentation in the lymphatics. The mechanical theory, which the present case seems to support, has attracted most attention in recent reports although it is by no means new; it postulates that air is forced through a breach in the mucosa by vomiting or by active peristalsis. In a review of 85 cases Nitch (1924) reported a peptic ulcer in 50% of cases, and of these 83% had stenosis. A lesion of the mucosa was found in many of the remainder, and in only 21 was no lesion found or the point was not mentioned. One of the main complaints in the present case was ærophagy; the patient was continually bringing up large quantities of wind as well as passing flatus, features which can easily be understood from the radiographs. On the basis of this theory it is to be presumed that swallowed air was forced into the duodenal tissues by repeated vomiting and belching, and that by the aid of peristalsis it passed along the bowel wall into the jejunum.

In some cases at least the gas seems to enter the lymphatics and has been found in lymphatic glands and the lower part of the thoracic duct. In others it seems to leave the lymphatics and to pass retroperitoneally. Lerner and Gazin (1946) reported a case in which the gas was detected by X rays and was found at operation between the muscle of the diaphragm and the underlying peritoneum, a condition which has to be distinguished from true pneumoperitoneum.

The preoperative diagnosis of gas cysts may in many respects be of academic interest only, since they rarely cause symptoms, which are usually due to an associated disease. The cysts may, on occasion be shown radiographically as rounded translucent areas between coils of bowel, but the detection of a pneumoperitoneum in the absence of clinical evidence of perforation of a hollow viscus also seems to be pathognomonic. A similar finding has been reported previously in cases with gas cysts: it was described by Pybus (1934) in a case with pyloric stenosis. A large quantity of air escaped from the peritoneum in a case operated on for acute volvulus of the sigmoid colon associated with gas cysts and reported by Jones (1948); Sloan (1920), reporting a case associated with duodenal ulcer, published an X-ray film similar in many respects to the accompanying figure.

The method by which the pneumoperitoneum is formed is uncertain. In the present case there was no evidence of large cysts having ruptured; one must therefore assume either a process of diffusion or the repeated rupture of many small cysts.

SUMMARY

A case of gas cysts of the intestine is reported associated with a pneumoperitoneum.

The hypothesis of origin are briefly mentioned, and it is suggested that the mechanical theory is the one most suited to explain the present case.

The association of a pneumoperitoneum has been described in a few previously reported cases, and it is suggested that in the absence of evidence of perforated bowel its presence is pathognomonic of intestinal gas cysts.

I should like to thank Sir Cecil Wakeley for permission to publish this case.

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NEPHROTIC SYNDROME TREATED WITH INTRAVENOUS DEXTRAN

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Wallenius (1950) has reported the treatment of four cases of nephrotic œdema with intravenous dextran, and stated that after each infusion the urinary output always increased by at least 400 ml. a day. Other reports (Goldenberg et al. 1947, Grönwall and Ingelman 1945, Renfrew and Cretcher 1949) suggest that some samples of dextran may damage the kidney in animals; but Thorsén (1949) has given as much as 600 g. intravenously to a patient without impairing renal function.

We report here an attempt to reduce the extreme œdema of a patient with the nephrotic syndrome by giving intravenous dextran. This treatment produced no clinical improvement but brought about changes in blood-volume greater than any previously reported to have been produced by dextran in man.

CLINICAL RECORD

A man, aged 69, complained of puffy eyes for the last ten years and swelling of the ankles since December, 1948. In November, 1949, his œdema became generalised, and by December, 1949, admission to hospital became necessary; he was transferred to the Cowley Road Hospital in March, 1950. There was no previous history of renal disease.

TABLE I—BLOOD ANALYSES BEFORE DEXTRAN TREATMENT

Date 1950	Urea (mg. per 100 ml.)	Plasma-protein (g. per 100 ml.)	Plasma-albumin (g. per 100 ml.)	Cholesterol (mg. per 100 ml.)
Feb. 2 ..	42	4·1	1·9	—
April 4 ..	33	3·5	1·8	690
May 9 ..	56	3·8	1·8	364*
June 20 ..	104	4·2	1·5	—

* After a month's course of sodium thyroxine.

On examination in March, 1950, he had gross generalised pitting œdema; his blood-pressure was 150/90 mm. Hg, and his optic fundi were normal. His urine contained 1–3 g. of protein per 100 ml., with hyaline and granular casts, and culture was consistently sterile. The blood Wassermann reaction was negative. There was no clinical or other evidence of cardiac, hepatic, or amyloid disease, and nephrotic syndrome (type 2 nephritis) was therefore diagnosed.

Treatment and Progress.—The patient was treated with a high-protein (more than 200 g. a day), low-salt (not more than 750 mg. of sodium a day) diet, and given many different diuretics. His fluid intake was usually 50–60 fl. oz. (1400–1700 ml.) per day, and the urinary output without diuretics 30–35 fl. oz. (850–1000 ml.) per day. The only effective diuretic was mersalyl, of which he received 70 ml. during his illness; the greatest diuresis produced was 120 oz. (3400 ml.). He also received 1 pint of double-strength plasma, and later 1 pint of quadruple-strength plasma, without benefit.

Acupuncture with Southey's tubes was performed six times and gave considerable relief, 16 pints of œdema fluid being removed on one occasion. The blood-pressure remained unchanged, and no retinopathy developed, but the patient's general condition (see table I) slowly deteriorated. He gradually developed resistance to mersalyl and his œdema became so serious that it was decided (in view of the Wallenius' report) to try intravenous dextran.

Dextran Treatment.—On June 20, 1950, he was given 1 pint of a 15% salt-free dextran solution in water * over a period of an hour. This material proved extremely difficult to inject, owing to its high viscosity and the production of venous spasm, and a "cut-down and cannula" technique was necessary. The patient had a rigor (101·4°F) after the injection, with profuse sweating, and during the next week he slowly became uræmic, drowsy, and moribund. The urinary output then spontaneously increased to 60 fl. oz. (1700 ml.) per day, and although he appeared to be in extremis his œdema subsided for the first time. During the second week following this injection he slowly recovered, but only to return to his original œdematous condition. The adverse effect of this infusion was attributed to faulty injection technique or to the material injected.

On Oct. 11, 1950, he was given 2 pints of 10% salt-free dextran † in 5% glucose; there were no technical difficulties in giving this injection. The manufacturers told us that this material was "heterogeneous, with a mean molecular weight of 104,000, and 30% excretion occurred in the urine of normal rabbits during a 24-hour period."

On Oct. 16, the patient was given 2 pints of 10% dextran † in 5% glucose.

These two last injections had no ill effects. There was no change in the blood-pressure, nor was there any diuresis during or after the injections. Dextran produced no detectable improvement in the patient's condition, although he did regain the ability to produce a diuresis in response to mersalyl. Over the next two months he slowly deteriorated, becoming uræmic, and he died in coma with bronchopneumonia on Dec. 7, 1950; the œdema persisted until death. Necropsy confirmed the diagnosis of chronic glomerulonephritis.

BIOCHEMICAL OBSERVATIONS

Plasma-proteins were determined by the method of **Howe (1921)**, blood-urea by the method of Archer and Robb (1925), hæmoglobin by an oxyhæmoglobin photoelectric method, and hæmatocrit by Wintrobe's method.

* Supplied by the East Anglia Chemical Co. Ltd., Darlington.
† Manufactured by Messrs. Bengers Ltd., Holmes Chapel, Cheshire.

TABLE II—EFFECT OF INTRAVENOUS DEXTRAN

Date 1950	Hours from end of injection	Blood-urea (mg. per 100 ml.)	Plasma-proteins (g. per 100 ml.)		Plasma-dextran (mg. per 100 ml.)	Hæmoglobin (g. per 100 ml.)	Hæmatocrit %
			Total	Albumin			
June 20	—	104	4·2	1·5	Nil	11·1	37
" "	One pint of 15% salt-free dextran						
" "	1	104	2·2	1·0	1600	8·2	26
	3	104	2·2	1·1	1000	9·3	28
	6	104	3·2	1·0	1000	9·2	28
	12	104	3·5	1·3	1070	9·6	29
" 21	24	104	3·5	1·1	860	9·3	30
" 22	48	127	4·3	1·6	1030	10·4	34
" 26	144	170	4·8	1·8	200	—	—
" 28	—	132	4·5	1·7	100	—	—
July 4	—	86	4·4	1·8	Nil	9·7	32
" 10	—	84	4·4	1·9	Nil	10·2	29
Oct. 11	—	120	4·6	1·4	Nil	10·8	37
" "	Two pints of salt-free dextran in 5% glucose						
" "	1	114	2·8	0·7	1020	7·3	24
	2	117	2·8	0·8	1000	8·0	26
	4	117	2·8	0·7	830	8·4	27
	6	111	3·2	0·7	800	9·4	31
	12	114	3·2	0·8	560	9·0	28
" 12	24	108	3·5	1·0	480	9·0	28
" 13	48	92	3·7	1·1	500	11·4	30
" 15	96	144	4·5	1·4	310	12·1	39
" 16	118	150	4·6	1·3	300	11·2	36
" "	Two pints of salt-free dextran in 5% glucose						
" "	1	143	2·8	0·7	880	7·5	25
	12	148	2·8	0·7	950	9·0	28
" 17	24	140	3·1	1·0	880	9·7	31
" 18	48	130	4·0	1·0	840	9·4	31
" 20	96	115	4·1	1·3	550	9·1	31
Nov. 28	—	220	4·6	1·8	Nil	9·8	31

Dextran in blood and œdema fluid was determined by a modification of the method of Klevås (1944).

Dextran in the deproteinised material was hydrolysed by heating with an equal volume of *N* sulphuric acid at 100°C for three hours. The solution was neutralised, and the reducing sugar was determined by the method of Folin and Wu (1920). The sugar present before hydrolysis was subtracted from this figure, giving the sugar liberated from dextran. Calibration with 15% dextran showed that the amount of sugar liberated was about equal to the amount of dextran taken; this conclusion is in agreement with Hehre (1946). This method was also used with œdema fluid but could not be used with urine.

Details of changes in blood-urea and plasma-protein levels, hæmoglobin, hæmatocrit, and plasma-dextran levels are given in table II. The blood-sugar level, the urea and protein levels in the œdema fluid and in urine, and the specific gravity of the urine showed no significant changes during or after any of these injections.

DISCUSSION

The most remarkable effect of giving intravenous dextran to this patient was the immediate hæmodilution. Within an hour of ending each injection the blood-volume indicated by plasma-protein, albumin, hæmoglobin, and hæmatocrit values, had increased by about 30% (the true blood-volume could not be estimated by the current methods in this patient owing to renal damage). These changes were similar after all three injections and were greater than those previously reported by Bull et al. (1949) and Turner et al. (1949).

This massive movement of water from the tissues into the circulation produced no obvious reduction in œdema and no signs of venous congestion or heart-failure. Bull et al. (1949) emphasised the danger of overloading the circulation, but the present case suggests that a normal cardiovascular system can adequately accommodate this large increase in blood-volume. Nevertheless the risk of producing acute heart-failure must be borne in mind.

Our inability to detect dextran in any sample of œdema fluid during these experiments does not support the "capillary damage" theory of nephrotic œdema. But no firm conclusion can be drawn from this observation; for even if some dextran did pass into the œdema fluid it may have been so diluted as to be undetectable by our methods. Further, the dextran molecules may have been too large to permeate the capillary wall even if it were "damaged."

Dextran remained in the blood of this patient for at least five days after each injection, which is rather longer than has been reported by most investigators. There was no increase in the specific gravity of the urine, which suggests that the dextran was only slowly excreted in the urine.

Thorsén (1950) states that some dextran is retained by "organs such as the liver" (presumably the reticuloendothelial system). In the present case, however, Dr. Frank Fletcher could not detect dextran by staining methods in any of the tissues examined post mortem. (A positive reaction observed in the cells of the terminal ileum and pylorus may be, he says, a normal finding. It may, however, be confirmation of Engstrand and Åberg's (1950) conclusion that dextran is also excreted by the bowel.)

We therefore conclude that dextran withdraws fluid from the extravascular space, and this leads to considerable increase in blood-volume. In contrast to the cases reported by Wallenius (1950), diuresis did not develop in this patient, possibly because of the poor functional capacity of his kidneys. It is noteworthy that, even though the dextran did not produce diuresis, the ability to respond to mersalyl was temporarily restored. There is no evidence that dextran produced further renal damage or in any way contributed to the fatal outcome.

SUMMARY

Salt-free dextran given intravenously to a patient with nephrotic œdema had no effect on his clinical condition.

Dextran produced an immediate increase of about 30% in the blood-volume, with no symptoms or signs of circulatory overloading.

No diuresis resulted from this hæmodilution.

No dextran was detected in the œdema fluid during and after the injections or in tissues examined post mortem two months after the last infusion.

We wish to thank Dr. Frank Fletcher, of Messrs. Bengers Ltd., for his ready assistance and for examining the tissues for dextran; Dr. A. H. T. Robb-Smith for permission to quote from pathological reports; and Mr. J. R. P. O'Brien for much valuable discussion.

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FOUR CASES OF APPENDICITIS IN ONE FAMILY IN A WEEK

J. M. E. JEWERS
M.B. Aberd., F.R.C.S.E.
SENIOR SURGICAL REGISTRAR, WEYMOUTH AND DISTRICT HOSPITAL, WEYMOUTH

THE occurrence of appendicitis in four children of a family of six within the space of six days seems unusual enough to be put on record. Altogether five members of the family were admitted to this hospital in a week, but in the fifth case the abdominal pain was probably due to a mild gastro-enteritis.

CASE-RECORDS

Case 1.—Girl, aged 6 years. Admitted on Nov. 24, 1951. Had complained of intermittent periumbilical pain for last three days, constant in right iliac fossa for 14 hours. Vomited 6–8 times during previous 48 hours. Bowels open on previous evening; stools green. Had been treated for ringworm of scalp with X rays and pronounced cured 10 days before admission.

On examination: Desperately ill, with white face, black hollows below eyes, and tongue furred and dry. Fauces injected. Bare area of scalp 2 × 2 in. over left parietal bone (hair cut short for treatment of ringworm). Generalised tenderness of abdomen, most definite over McBurney's point. Per rectum: tender over pouch of Douglas, and mass palpable by tip of examining finger. Temperature 103°F, pulse-rate 150, and respirations 34 per minute.

Operation (Nov. 6): Right paramedian incision. A little pale yellow opaque fluid escaped on opening peritoneum, well-marked general peritonitis present. Appendix gangrenous, perforated, and covered with omentum which oozed pus when touched. Coil of terminal ileum was adherent to inflamed omentum and appendix. Omentum, ileum, and fibrin had formed walls of abscess, which had burst its confines. Appendix was removed and drain inserted deep to rectus muscle. Pulse-rate at start of operation 154, and when patient left theatre "about 200."

Postoperative Treatment.—2½ pints of ⅕th physiological saline and 5% dextrose given intravenously; 100,000 units of penicillin four-hourly and 0·5 g. of streptomycin intramuscularly thrice daily; 200 mg. of 'Aureomycin' given intravenously six hours after operation. Toxæmia profound for 18 hours, when general condition slowly improved. Bowels opened spontaneously 52 hours after operation.

Case 2.—Boy, aged 7 years. Admitted on Nov. 28. Had been "unwell" for a few days. Pain around umbilicus for three hours, worst in right iliac fossa. Bowels opened three times on day of admission. Nausea but no vomiting.

On examination: Healthy looking boy who gave a good story and answered questions definitely. Tongue clean and breath pleasant. Throat and lungs normal. Abdomen slightly tender over McBurney's point on deep palpation, with slight muscle-guarding. Per rectum: tenderness high up on right side of rectum. Temperature 100·2°F, pulse-rate 80, and respirations 22 per minute.

Diagnosis: Early catarrhal appendicitis.

Operation (Nov. 28): Begun 4½ hours after first complaint of abdominal pain. Right paramedian incision. Appendix 4 in. long lying over brim of the pelvis; proximal 2½ in. healthy, but the distal 1½ in. grey-green and distended to diameter of ½ in. On applying tissue forceps on healthy portion of the appendix, diseased portion burst, adjacent swab being showered with beads of brownish-yellow and foul-smelling fluid. Appendix was removed and wound closed without drainage. Postoperative course uneventful.

Case 3.—Girl, aged 6 years (twin sister of case 1). Admitted on Nov. 29. Had been getting general abdominal pain for 24 hours, with nausea. Bowels open 5 A.M. on day of admission. Treated for threadworms at intervals over previous two years.

On examination: Healthy looking girl. One enlarged and slightly tender cervical gland, 1 × ¾ in., on right side of neck. Fauces and lungs normal. Abdomen soft with discomfort only in right iliac fossa. Per rectum: tender on right side. Temperature 99°F, pulse-rate 104, and respirations 20 per minute.

Diagnosis: In view of findings in case 2 acute appendicitis or mesenteric adenitis was diagnosed.

Operation (Nov. 29): Right paramedian incision. Appendix looked congested, with distended blood-vessels in outer coat. Dozens of enlarged juicy mesenteric glands extending from meso-appendix up to region of pancreas. Appendix removed and wound closed. On opening appendix, found to be congested, with swollen mucosa and mucopus at distal end of lumen containing one threadworm.

Case 4.—Boy, aged 12½ years. Admitted on Nov. 30. Had been having pain in right iliac fossa for 24 hours, resembling but worse than pain felt in same place at intervals for six months. Tonsils removed a year ago, since when has had constant "sniff" due to excessive secretion from left nostril.

On examination: Healthy looking boy. Clear discharge from left nostril. Throat and lungs normal. Tongue furred and breath offensive. Tender in right iliac fossa on deep palpation. Per rectum: slight tenderness on right side. Temperature 99°F, pulse-rate 70, and respirations 20 per minute.

Diagnosis: Early catarrhal appendicitis or mesenteric adenitis.

Operation (Nov. 30): Right paramedian incision. Appendix looked congested. A lymph-gland in meso-appendix measured 1 × ¾ in. and was red and juicy. Numerous similar glands seen in ileocæcal region of mesentery. Appendix removed and wound closed. Mucosa of appendix found to be diffusely swollen, with an area of hæmorrhage and ulceration at mid-point.

Case 5.—Girl, aged 10½ years. Admitted on Dec. 1, general abdominal pain for 24 hours, making her double up. No nausea or vomiting. Bowels opened three times on day of admission, said to look normal. No recent sore throat or coryza.

On examination: Healthy looking girl. Tongue furred and throat red. Slight tenderness on deep pressure in right iliac fossa. Per rectum: slight general discomfort. Temperature 98·8°F, pulse-rate 90, and respirations 20 per minute, cell-count 8000 per c.mm.

Diagnosis: ? Alimentary upset.

COMMENTS

These four cases provided considerable food for thought. Cases 1 and 2 obviously had highly infected appendices; the wall of the appendix rapidly swelled sufficiently to occlude the lumen, resulting in the obstructive type of appendicitis. No fæcolith or old fibrous stricture, which might have caused mechanical

obstruction, was seen. Case 3 was known to have harboured threadworms for two years and presumably these were responsible for the changes seen in her appendix. Case 4 had a definite catarrhal appendicitis. Whether the changes found in his appendix began as the follicular appendicitis mentioned by Aird (1949), which he says may accompany a non-specific mesenteric adenitis, is an interesting question. Certainly the glands seen in the mesentery in case 4 resembled those in non-specific adenitis, but in that condition there is usually a higher temperature and more severe pain.

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Dr. J. J. R. DUTHIE (Edinburgh) remarked that the possibility of refractory protein-iron binding might be investigated; and Dr. J. H. H. GLYN stated that in his experience intravenous iron therapy sometimes produced a rapid rise of hæmoglobin before there was evidence of bone-marrow response.

PRIMARY OSTEO-ARTHRITIS

Dr. ROBERT MOORE (Manchester) made a plea for the recognition of a certain kind of osteo-arthritis as a distinct disease. Although degenerative joint disease was regarded as a wearing-out process, since it particularly attacked joints which had suffered undue strain from weight-bearing, deformity, or previous disease, there were cases whose evolution was different and which presented a different pattern; and these he classified as primary degenerative osteo-arthritis. Of 391 cases of osteo-arthritis in Manchester in the last three years he had made a special study of 196. Of these, 120 were of primary osteo-arthritis, nearly 80% of them being in women at or near the menopause. The characteristic features of the disease included a tendency for certain joints, particularly the distal interphalangeal and first carpometacarpal joints, to be affected, although no joint was immune. Each joint went through two stages—acute and chronic. In the acute phase there was spontaneous joint pain, often in waves and especially troublesome at night; this was described as a burning, bursting, or tingling pain. The affected fingers were swollen and reddened, and though this disorder was often diagnosed as rheumatoid arthritis the peripheral vascular abnormalities and characteristic spindling of this disease were absent. The erythrocyte-sedimentation rate was often increased, but not to the great extent found in rheumatoid arthritis. Small cystic swellings sometimes developed over the terminal interphalangeal joints; these might even be opened by the patient in an attempt to relieve her pain, with the subsequent discharge of a glairy colourless fluid. In other parts of the body pain was of a deep, aching nature and was made worse by cold, movement, or venous occlusion. After several months the acute phase subsided, leaving a deformed but painless hand with bony outgrowths including Heberden's nodes. Permanent crippling was very rare. Other features which differentiated this arthritis from the rheumatoid variety were the absence of constitutional symptoms and of soft-tissue lesions (as in bursæ or tendon sheaths), nodules, rashes, and eye involvement. It did not respond to cortisone, and the differential agglutination titre (Rose's test) and other serological tests usually positive in rheumatoid arthritis were consistently negative.

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Dr. E. G. L. BYWATERS noted that not enough cases had yet been investigated as regards serum-fibrinogen and erythrocyte-sedimentation rate. He wondered if differences in the activity of the disease process might account for these other differences.

CLINICAL ASSAY OF A.C.T.H.

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walking, and range of joint movement. With this method evaluation was not so easy as in other cases where a fixed response was aimed at and the doses required to achieve it compared. One difficulty always occurred. The patient and his disease did not remain the same over the period of test. More promise was shown by intravenous infusion of A.C.T.H. Here the response to small doses was rapid, and the test could be repeated often. Unfortunately difficulties were encountered with venous thrombosis. Whichever way A.C.T.H. preparations were tested, the eosinopenic response they produced and the increase of 17-ketosteroid excretion they caused did not reflect their clinical activity.

Thus there was as yet no alternative to clinical assay, which, however, was crude, tedious, and subject to many variables.

PUNCH BIOPSY OF THE SYNOVIAL MEMBRANE

Dr. BRUCE CRUICKSHANK (Edinburgh) spoke of the need for caution in interpreting the histology of synovial membrane which had been obtained by punch biopsy. Some American writers had assumed that they could attribute to the therapy in use at the time any histological evidence of improvement found in the synovial membrane obtained in serial punch biopsies. This was not necessarily so.

He had examined 35 diseased joints, and in only 16 of them were the microscopic appearances constant from one site to another. In 10 cases there was considerable variation in adjacent parts of the synovial membrane, and sometimes even in different parts of the same section. It was possible to see in one piece of tissue all the changes of active rheumatoid arthritis with diffuse cellular infiltration and collagen necrosis, while a nearby piece of tissue showed only healing processes or inactive scars.

Similar variation could be found in the synovial membranes in rheumatic fever, disseminated lupus, and gout.

A.C.T.H. and Cortisone

CORTISONE AND HEALING OF THE EYE

Dr. NORMAN ASHTON pointed out that the rabbit's eye was satisfactory for the study of wound healing.

Ten rabbits with a perforating wound of the cornea were treated daily with subconjunctival injections of cortisone. They were killed, along with paired controls, at 24-hour intervals and the eyes sectioned. The first change noted was inhibition of migration of cells into the wounded cornea and of the fibrinous coagulum which should seal the perforation. Subsequently there was inhibition both of fibroblastic repair of the cornea and of regeneration of the endothelial lining of the anterior chamber. On the other hand, the corneal epithelium proliferated and regenerated at a normal or increased rate. In other experiments he had produced opacity and vascularisation of the rabbit's cornea by injecting alloxan into the anterior chamber, and had studied the effect of cortisone on the transfer of fluorescein across the blood-aqueous barrier in these inflamed eyes.

It was clear that cortisone had no effect on the permeability of normal capillaries but could reduce the increased permeability of inflamed capillaries.

VARIATION IN INDIVIDUAL RESPONSE

Dr. J. H. KELLGREN (Manchester) had used four indices in the study of variation in individual response to A.C.T.H. and to cortisone: (1) the patient's own assessment, (2) the results of daily clinical evaluation including measurements of pain and function, (3) the rise of urinary steroid output, and (4) the degree of relapse on hormone withdrawal.

Patients were given a three-day course of A.C.T.H. followed, after a sufficient rest period, by a standard three-day course of cortisone. The response was of three types: (*a*) equally good response to both hormones, (*b*) response to neither, and (*c*) response to one or the other (not necessarily in the same way). Apart from this, the condition of some did not respond to either treatment yet relapsed when treatment was withdrawn. This could be explained if the test dose was within the patient's physiological range and simply replaced and suppressed endogenous adrenal cortical secretion.

Dr. G. D. KERSLEY (Bath) said that he, too, had had patients refractory to A.C.T.H. Two cases of rheumatoid arthritis had not responded to maximum stimulation with intravenous A.C.T.H. despite an eosinopenic response. One patient also resisted 500 mg. a day of cortisone. Professor MACLAGAN had noted a similar variation in responsiveness in hæmolytic anæmia.

LONG-TERM TREATMENT OF RHEUMATOID ARTHRITIS

Dr. W. S. C. COPEMAN summarised his experience of treating with cortisone 20 cases of rheumatoid arthritis. Each patient had been treated for several months, initially in hospital and latterly as an outpatient. All had responded to cortisone; and 17 had been got back to work or to a comfortable life, sometimes after years of crippledom. Careful selection of patients was essential since one relied on them a good deal for assessment of progress. They must be coöperative, of stable personality, and good witnesses. In using cortisone he had abandoned the "loading dose" and now started with a moderate dose, which was varied according to the clinical indications. One patient went into clinical remission, which persisted without treatment. So far side-effects had not been serious. Painless cellulitis had occurred in some cases and might "flare up" severely when treatment was withdrawn. One patient had died from apparently unrelated cerebral hæmorrhage. Another, who had diabetes, found that joint symptoms were not relieved unless sufficient cortisone was given to produce glycosuria.

ANKYLOSING SPONDYLITIS

Dr. H. F. WEST (Sheffield) said that it was generally agreed that cortisone could arrest the progress of ankylosing spondylitis; if given early enough it could produce striking clinical remissions with freedom from pain and stiffness. The great difference between ankylosing spondylitis and rheumatoid arthritis was that the former was an ankylosing disease. If joint ankylosis was delayed at the stage where unstable callus had bridged the gap then neither solid bony union nor free movement could occur and the joint remained painful.

This had been strikingly evident in one patient who had had fulminating ankylosing spondylitis which had involved one hip-joint before the other. She had been relieved of pain in the recently involved joint only. The other joint was already in a state of unstable ankylosis and had remained very painful. He thought it would be necessary to reduce or interrupt treatment to allow this hip to become firmly united.

Dr. DUDLEY HART showed a series of comparisons between A.C.T.H. and deep X-ray therapy. A similar degree of remission was produced, but that from deep X-ray therapy lasted longer.

STILL'S DISEASE

Dr. BYWATERS pointed out that Still's disease differed in no way from adult rheumatoid arthritis except in the age of the patient. Certain clinical features were, however, more common in children. As in adults the enlarged lymph-nodes and spleen and the arthritis, fever, and malaise rapidly responded, and the child began to put on weight again; but the typical rash and pericarditis might persist despite treatment. Remissions produced by cortisone sometimes lasted several weeks, and he compared these with a remission produced by intercurrent measles; both were followed by relapse. One patient with severe amyloidosis and rheumatoid arthritis recovered from arthritis during treatment, but her amyloidosis (judged by the size of liver and spleen and by renal function and Congo-red tests) was not improved. In other cases, where symmetrical joint deformities had needed manipulation, cortisone had

obstruction, was seen. Case 3 was known to have harboured threadworms for two years and presumably these were responsible for the changes seen in her appendix. Case 4 had a definite catarrhal appendicitis. Whether the changes found in his appendix began as the follicular appendicitis mentioned by Aird (1949), which he says may accompany a non-specific mesenteric adenitis, is an interesting question. Certainly the glands seen in the mesentery in case 4 resembled those in non-specific adenitis, but in that condition there is usually a higher temperature and more severe pain.

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Thus there was as yet no alternative to clinical assay, which, however, was crude, tedious, and subject to many variables.

PUNCH BIOPSY OF THE SYNOVIAL MEMBRANE

Dr. BRUCE CRUICKSHANK (Edinburgh) spoke of the need for caution in interpreting the histology of synovial membrane which had been obtained by punch biopsy. Some American writers had assumed that they could attribute to the therapy in use at the time any histological evidence of improvement found in the synovial membrane obtained in serial punch biopsies. This was not necessarily so.

He had examined 35 diseased joints, and in only 16 of them were the microscopic appearances constant from one site to another. In 10 cases there was considerable variation in adjacent parts of the synovial membrane, and sometimes even in different parts of the same section. It was possible to see in one piece of tissue all the changes of active rheumatoid arthritis with diffuse cellular infiltration and collagen necrosis, while a nearby piece of tissue showed only healing processes or inactive scars.

Similar variation could be found in the synovial membranes in rheumatic fever, disseminated lupus, and gout.

A.C.T.H. and Cortisone

CORTISONE AND HEALING OF THE EYE

Dr. NORMAN ASHTON pointed out that the rabbit's eye was satisfactory for the study of wound healing.

Ten rabbits with a perforating wound of the cornea were treated daily with subconjunctival injections of cortisone. They were killed, along with paired controls, at 24-hour intervals and the eyes sectioned. The first change noted was inhibition of migration of cells into the wounded cornea and of the fibrinous coagulum which should seal the perforation. Subsequently there was inhibition both of fibroblastic repair of the cornea and of regeneration of the endothelial lining of the anterior chamber. On the other hand, the corneal epithelium proliferated and regenerated at a normal or increased rate. In other experiments he had produced opacity and vascularisation of the rabbit's cornea by injecting alloxan into the anterior chamber, and had studied the effect of cortisone on the transfer of fluorescein across the blood-aqueous barrier in these inflamed eyes.

It was clear that cortisone had no effect on the permeability of normal capillaries but could reduce the increased permeability of inflamed capillaries.

VARIATION IN INDIVIDUAL RESPONSE

Dr. J. H. KELLGREN (Manchester) had used four indices in the study of variation in individual response to A.C.T.H. and to cortisone: (1) the patient's own assessment, (2) the results of daily clinical evaluation including measurements of pain and function, (3) the rise of urinary steroid output, and (4) the degree of relapse on hormone withdrawal.

Patients were given a three-day course of A.C.T.H. followed, after a sufficient rest period, by a standard three-day course of cortisone. The response was of three types: (*a*) equally good response to both hormones, (*b*) response to neither, and (*c*) response to one or the other (not necessarily in the same way). Apart from this, the condition of some did not respond to either treatment yet relapsed when treatment was withdrawn. This could be explained if the test dose was within the patient's physiological range and simply replaced and suppressed endogenous adrenal cortical secretion.

Dr. G. D. KERSLEY (Bath) said that he, too, had had patients refractory to A.C.T.H. Two cases of rheumatoid arthritis had not responded to maximum stimulation with intravenous A.C.T.H. despite an eosinopenic response. One patient also resisted 500 mg. a day of cortisone. Professor MACLAGAN had noted a similar variation in responsiveness in hæmolytic anæmia.

LONG-TERM TREATMENT OF RHEUMATOID ARTHRITIS

Dr. W. S. C. COPEMAN summarised his experience of treating with cortisone 20 cases of rheumatoid arthritis. Each patient had been treated for several months, initially in hospital and latterly as an outpatient. All had responded to cortisone; and 17 had been got back to work or to a comfortable life, sometimes after years of crippledom. Careful selection of patients was essential since one relied on them a good deal for assessment of progress. They must be coöperative, of stable personality, and good witnesses. In using cortisone he had abandoned the "loading dose" and now started with a moderate dose, which was varied according to the clinical indications. One patient went into clinical remission, which persisted without treatment. So far side-effects had not been serious. Painless cellulitis had occurred in some cases and might "flare up" severely when treatment was withdrawn. One patient had died from apparently unrelated cerebral hæmorrhage. Another, who had diabetes, found that joint symptoms were not relieved unless sufficient cortisone was given to produce glycosuria.

ANKYLOSING SPONDYLITIS

Dr. H. F. WEST (Sheffield) said that it was generally agreed that cortisone could arrest the progress of ankylosing spondylitis; if given early enough it could produce striking clinical remissions with freedom from pain and stiffness. The great difference between ankylosing spondylitis and rheumatoid arthritis was that the former was an ankylosing disease. If joint ankylosis was delayed at the stage where unstable callus had bridged the gap then neither solid bony union nor free movement could occur and the joint remained painful.

This had been strikingly evident in one patient who had had fulminating ankylosing spondylitis which had involved one hip-joint before the other. She had been relieved of pain in the recently involved joint only. The other joint was already in a state of unstable ankylosis and had remained very painful. He thought it would be necessary to reduce or interrupt treatment to allow this hip to become firmly united.

Dr. DUDLEY HART showed a series of comparisons between A.C.T.H. and deep X-ray therapy. A similar degree of remission was produced, but that from deep X-ray therapy lasted longer.

STILL'S DISEASE

Dr. BYWATERS pointed out that Still's disease differed in no way from adult rheumatoid arthritis except in the age of the patient. Certain clinical features were, however, more common in children. As in adults the enlarged lymph-nodes and spleen and the arthritis, fever, and malaise rapidly responded, and the child began to put on weight again; but the typical rash and pericarditis might persist despite treatment. Remissions produced by cortisone sometimes lasted several weeks, and he compared these with a remission produced by intercurrent measles; both were followed by relapse. One patient with severe amyloidosis and rheumatoid arthritis recovered from arthritis during treatment, but her amyloidosis (judged by the size of liver and spleen and by renal function and Congo-red tests) was not improved. In other cases, where symmetrical joint deformities had needed manipulation, cortisone had

been used to cover the operation on one side but not on the other. There was no objective difference between the two joints in the immediate reaction to manipulation; and the use of cortisone in this manner seemed to be without value.

GOUT

Dr. KERSLEY had confirmed that in gout there was a low 17-ketosteroid excretion. Cortisone or A.C.T.H. could produce an immediate remission in acute gout but 5–6 days after withdrawal of cortisone there was a severe relapse. Attempts to provoke this relapse in the chronic phase as a diagnostic test had given unreliable results. The mechanism of cortisone-induced remissions was still obscure. There was no reduction in the plasma uric acid. Tophi softened and became smaller, while those that had ulcerated discharged less. He concluded that cortisone was of value firstly in the acute attack of gout provided that large doses of colchicine were given to prevent the withdrawal relapse, and secondly in the rare malignant tophaceous gout where large urate deposits endangered joint function or possibly life.

RECENT TRENDS IN THE U.S.A.

Dr. DUTHIE said that in the U.S.A. cortisone was now most commonly given by mouth. Clinicians had abandoned the initial loading dose, starting instead with a daily dose of 50–75 mg. which was gradually increased if necessary. On this low dosage about one-third of all patients could be controlled without side-effects; the incidence of side-effects increased with the dose. Even mild side-effects, if they persisted, might cause the patient voluntarily to suspend treatment. Serious side-effects had been increasingly reported. These included the masking of intercurrent infections and of surgical emergencies such as appendicitis. Latent tuberculosis had been fatally reactivated; and peptic ulcers had first appeared, had bled, or had perforated during treatment. In addition, fractures of long bones, collapse of vertebral bodies, thrombophlebitis with embolic complications, major psychoses, and coronary infarction had been reported. Cortisone was beginning to be recognised as a drug of addiction; indeed there was a special "cortisone-withdrawal" syndrome. Patients complained of profound weakness, exhaustion, anorexia, and generalised aching pains made worse by movement and not easily controlled by analgesics. These symptoms persisted when tests showed that adrenal function had returned to normal. Combined with a rheumatic relapse, the withdrawal syndrome produced great distress. A very rare but perhaps significant complication of cortisone withdrawal had been the first appearance in six cases of rheumatoid arthritis of the signs and symptoms of disseminated lupus, or of periarteritis nodosa.

Despite all research the fundamental site of action of cortisone remained unknown. Clinicians now used it not as a substitute for, but as an auxiliary to, other methods of treatment. Complete suppression of symptoms was no longer aimed at. There was no evidence that cortisone altered the natural course of the disease. Radiological progression had been noted in cases kept symptom-free. The increased danger of secondary osteo-arthritis, due to greater activity, should be recognised. Other methods of administration were being explored—in particular intravenous cortisone, intravenous A.C.T.H., intra-articular cortisone, and long-acting preparations of A.C.T.H. Some promise was shown by intra-articular injections of compound F which, unlike cortisone acetate, was well tolerated in the inflamed joint. Opinion as to the value of these substances could be summarised as follows:

Some believe that the benefits are so much greater than those from all other forms of treatment that their use is fully justified on outpatients and with the minimum of laboratory control. At the other extreme are those who think the risks of long-term administration are so great in most patients that it should never be advised. The majority of clinicians think that long-term therapy may be justifiable, combined with orthodox methods, in patients whose condition is steadily deteriorating. Short-term administration for a specific purpose, such as covering manipulation or operation or to facilitate correction of deformities by other methods, is regarded as of real value. Intra-articular injection has had only a limited trial but justifies further study. The first enthusiasm has been replaced by a more cautious and conservative attitude. A tremendous amount of research into the mode of action is going on, but with little success so far.

Reviews of Books

Tumours of the Eye

ALGERNON B. REESE, M.D., D.SC., F.A.C.S., attending ophthalmologist and pathologist, Institute of Ophthalmology, Presbyterian Hospital, New York; clinical professor of ophthalmology, College of Physicians and Surgeons, Columbia University. London: Cassell. 1951. Pp. 574. £7 7s.

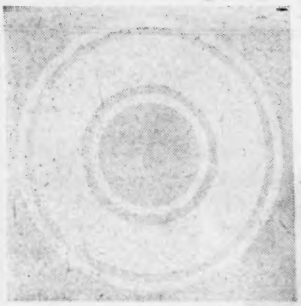
THE text of this elaborate work concerns "all tumours and tumour like lesions, which directly and indirectly affect the eye"; so tumours of the orbit and ocular adnexæ are included. As pathologist to the Institute of Ophthalmology, New York, Dr. Reese has been able to draw on the stored knowledge and experience of several generations, and his comprehensive volume should delight all ophthalmologists. Tumours are arranged according to the tissue that predominates in them—angiomatous, melanotic, epithelial, fibromatous, bony, lymphomatous, &c.—and in each category there is not only a full account of the histology, signs, symptoms, differential diagnosis, and treatment, but also case-histories illustrated by the appearance of the tumour in life and its microscopic appearance after removal. Finally, Dr. Reese deals with the various surgical approaches to the orbit and the indications for each.

In English money the price is high, but in production the book is a model. With its bibliography extending over the past sixty years, it will long remain the standard authority on its subject. It stands as a complete justification for the case-recording and filing of pathological material which has been practised at the New York Ophthalmological Institute and which is now becoming possible also in this country.

The Kidney

Medical and Surgical Diseases. ARTHUR C. ALLEN, M.D., pathologist, James Ewing Hospital, and assistant attending pathologist, Memorial Cancer Center, New York. New York: Grune & Stratton. 1951. Pp. 583. $15.

ADVANCES in our understanding of renal pathology demand not only that the clinician should appreciate the histology of the renal lesions in his patients, but that the pathologist should attempt to explain the microscopical picture in terms of the functional upset defined by his clinical colleague. Both will welcome this book, for Dr. Allen has worked hard to correlate and combine the clinical and pathological findings in kidney disease. This book is thus one of the most complete accounts of renal pathology now available, profusely illustrated by excellent photographs and photomicrographs of all the common, and many rare, diseases of the kidney. The clinical conditions are clearly described, with plenty of references to the illustrations and to original papers. The sections on embryology and malformations are particularly good, and the book is likely to become a standard work of reference on the histology of the kidney in various vascular, infective, and toxic conditions. Dr. Allen, being a pathologist, has been unable to resist an involved classification of glomerular lesions: the use of such terms as "chronic membranous glomerulonephritis" and "chronic lobular glomerulonephritis" for the lesions in type II, or the nephrotic stage of nephritis, will not find ready acceptance in this country and can only make the existing confusion worse. This is, however, a minor objection which does not detract from the great value of the book.



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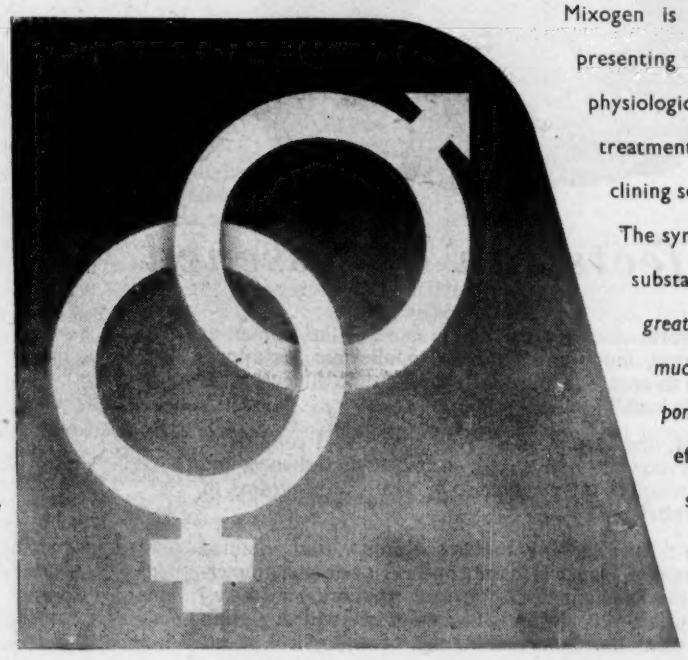

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THE LANCET
LONDON : SATURDAY, DEC. 22, 1951

The Large Hernia

Wer sich so einen Bruch anwachsen lässt, der soll ihn auch behalten. ("Whoever lets such a hernia develop, deserves to keep it.") That was KOCHER's [1] comment. But where a man wears his gut is very much his surgeon's business, except perhaps in visceroptosis.

At the Royal Society of Medicine on Dec. 5, Mr. GEOFFREY KEYNES and Mr. IVOR LEWIS analysed the principles of the repair of big hernias. The essence of their timely advice was this: the surgeon should cut his coat according to his customer's cloth, and he will rarely find any shortage of material of reasonable quality within the hernial area. The increasing use of darns, lattices, and filigrees, made of foreign materials, is in their view a retrograde step. Humility should come naturally to a surgeon, who is constantly working with living tissues; he should regard himself as no more than Nature's assistant. Whereas the elastic tissues of the abdominal wall can withstand strain and return to their former length, no foreign material, or the fibrous tissue it provokes, can do this: under stress, the steel wire and the silver filigree begin to fragment, and, as Prof. P. B. ASCROFT and Mr. M. R. EWING showed in the discussion, tantalum gauze almost always fractures within six months. The muscle and aponeurosis brushed aside by the hernia do not die; they are but tethered in a new position, and the surgeon's knife can readily free and prepare them afresh. Indeed, the muscle aponeuroses are to be regarded merely as flattened tendons, and they require the same type of surgery as other tendons. Living fascia grafts, or foreign material, may be used to approximate and hold them, but not to replace them.

LEWIS's classification is useful: the hernia the size of a fist is "large," and one the size of a head is "huge"—though American literature refers to them as "voluminous." As the openers emphasised, operation should not lightly be refused; age is no bar, and a much reduced vital capacity is the real hazard. (In 130 operations LEWIS had 2 deaths, and both were from cerebrovascular accidents.) Attempts have been made, in America, to accustom the abdomen to increased intra-abdominal pressure by preliminary induction of a pneumoperitoneum; BUNCH [2] has performed a two-stage operation in the massive scrotal hernia—deliberately creating a ventral hernia as a safety-valve, and later closing it. These aids are unnecessary; the return of some of the bowel may occasionally be encouraged by the steep Trendelenburg position, or even, as at the Mayo Clinic (WALTERS and BASKIN [3]), by suspending the scrotal mass with suitable pulleys. To prevent skin intertrigo, soap-and-water preparation is effective; but even so, as LEWIS said, this area should be carefully sealed off from the wound field. Extravagant skin excision is inadvisable, and removal of the redundant skin apron is better deferred. General muscle relaxant anæsthesia is a great advance, and, as KEYNES indicated, is preferable to local injection. Many of these hernias are of the "sliding" kind, with but little peritoneal sac; and often it is sufficient to return the slide, without opening the sac. The radical repair of these large hernias is often not a problem; for, as Mr. DAVID PATEY, president of the section, pointed out, the hernia neck is usually small and necessitates closure of a "cleft" rather than a "gap." To achieve this, healthy fresh tissue, from within the area, should be used. Scarred tissue should be eschewed, though occasionally it can be employed as a layer with an extra buffer action.

Aponeurotic tissue, held in new position, requires time for the vascural supply to become established, and for sound tendon-to-tendon union. Catgut lasts too short a time, and KEYNES favours fascia-lata strips, which assure broader approximation, and, as GALLIE's [4] experimental work showed, survive as living grafts. There are reasonable objections to such thigh strips; the inguinal ligament is often mutilated by the large needle and strips, and many patients afterwards complain of pain, discomfort, or weakness in the thigh. KEYNES has had good results with the McArthur type of operation, [5] in which strips of external obliques are employed, generally using a "boot-lace" technique. LEWIS prefers 'Nylon,' while others like silk thread or cotton; but the choice is of little consequence, provided the purpose is clean firm approximation. "We may take fancy for a companion, but must follow reason as our guide," as SAMUEL JOHNSON said of other things.

The Achilles' heel of such inguinal repair is usually the pubic corner. As Mr. NORMAN TANNER said, a relief incision of the conjoint tendon over the rectus allows the aponeurosis to slide and be sutured without tension—a modification of the Bloodgood operation, [6] in which this triangular flap is turned down. This manœuvre, often associated with TANNER's name, [7] is practised by many surgeons, and, as the external oblique is usually of good material in these cases, the canal strength can be reinforced by a "double-breasted" external oblique overlap. In this variation of the Willys Andrews operation, [8] the cord is made to run in superficial fashion. The only disadvantage of this operation is that too tight suturing is followed by testicular swelling and atrophy; excision of the contents of the spermatic cord is inadvisable.

In the discussion Mr. ANDREW MONRO drew attention to the Mayo Clinic follow-up of the McArthur operation; though at first the results appeared gratifying, there was an 11·8% recurrence at the end of five years (MAYO and KEELEY [9]). The lack of late follow-up statistics applies to the "darn" or lattice cases. Moreover, those who have watched this operation will have observed that it rarely is a pure lattice, for beneath it there is usually some type of approximation repair. The simile is often used—and we have used it ourselves [10]—that a hole

1. Kocher, T., quoted by Thorek, M. *Med. J. Rec.* 1930, **131**, 83.
2. Bunch, C. *U.S. Armed Forces Med. J.* 1951, **2**, 239.
3. Walters, W., Baskin, R. H. *Proc. Mayo Clin.* 1951, **26**, 332.
4. Gallie, W. E., LeMesurier, A. B. *Canad. med. Ass. J.* 1921, **11**, 504.
5. McArthur, L. L. *J. Amer. med. Ass.* 1901, **37**, 1162.
6. Bloodgood, J. C. *Ibid.* 1918, **70**, 515.
7. Tanner, N. C. *Brit. J. Surg.* 1942, **29**, 115.
8. Andrews, E. W. *Chicago med. Rec.* 1895, **9**, 67.
9. Mayo, C. W., Keeley, J. K. *Surg. Gynec. Obstet.* 1949, **89**, 603.
10. Editorial, *Lancet*, 1948, ii, 187.

in a sock is darned and not pleated. This is true; but no darn will hold if an underlying hole in the shoe—the intra-abdominal pressure—does not receive attention. Though commonly called a darn, the sutures resemble more the girders of an extension bridge, the gaps between which have to be filled in by fibrous tissue. Indeed, when the patient bends, the darn forms a mere wad. ASCROFT clearly showed this bending effect in tantalum gauze X-ray pictures; some 1200 full bending strains were required to fracture it. Sepsis is the great bugbear of such darns, and can incapacitate the patient for many months. KEYNES's criticism of these methods was not of the muffled kind; "it is easier," he said, "to remove a swab than floss silk." Monofilament nylon and stainless steel wire were said to have the advantage that septic wounds could heal without their extrusion. Such septic hernial wounds should not be allowed to continue discharging; if freely reopened at the end of six weeks the foreign material is often easily removed.

Both KEYNES and LEWIS lamented that incisional herniæ are still so common, especially after gynæcological surgery; greater care, they said, was required in preparing and closing the layers; for, as GALLIE observed years ago, firm sheath layer union required that no muscle or fat be interposed. The large incisional hernia often had a small neck, and these patients should be offered surgery rather than belts. The umbilical hernia, KEYNES thought, should be repaired at the time of a strangulation operation; the patient rarely gave the surgeon a further opportunity. Statistics are lacking, but the umbilical hernia recurrence-rate was believed to be high. The common use of catgut may be a factor; the late PETER MCEVEDY (a master of such hernia surgery) emphasised the importance of a continuous suture at the peritoneal line of overlap, and GREY TURNER stripped or criss-crossed the peritoneum of the overlapping layer so as to assure firm apposition. For the management of the colostomy incisional hernia, especially with the oblique incision, Mr. E. T. C. MILLIGAN gave some sound advice: the hernial wound should be completely repaired and the colostomy transplanted, by stab wound, higher up.

HERTZLER,[11] in his well-known book, observes: "to step on a banana skin and slip is no indication for returning to the quadruped fashion." An occasional recurrence after the rational repair with local layers is insufficient reason for abandoning this method. Look ye to the cobbling instead!

Purposes of Preventive Detention

IN *The Habitual Criminal*[12] Mr. NORVAL MORRIS reminds us that for the forty years before the passing of the Criminal Justice Act, 1948, the sole means by which English courts could deal with the problem of habitual criminality was part II of the Prevention of Crime Act, 1908. This Act gave the courts, for the first time, the power of sentencing a habitual criminal to a term of preventive detention.

The original idea was that the sentence should be *indeterminate*—as it is for criminal lunatics committed to Broadmoor. The indeterminate sentence, indeed, is being used successfully in Denmark; and it is said that the gradual realisation that he will not be discharged until he has made himself into another kind of man has a remarkably salutary effect on the criminal. The idea of an indeterminate sentence, however, has never appealed to the British, for reasons which on the whole do us credit; perhaps Magna Carta is too valuable an heirloom to gamble with, or perhaps, as Mr. MORRIS puts it, "we do not possess the ruthlessness of 'the pure heart.'" The most we could bring ourselves to accept was (and is) an *indefinite* sentence—that is, a sentence with a fixed limit but no fixed remission for good conduct. The 1908 Act also required that before serving his period of preventive detention the offender should do a term of penal servitude. This is generally described as the "dual track system."

The conditions under which preventive detention is served are, relatively, not unpleasant.

> Prisoners begin with a credit of 1*s*., and are able to earn small sums by tagmaking, bookbinding, cleaning, gardening, or work of other kinds. They wear better clothing than other types of prisoner, and they are allowed to decorate their cells with pictures, to own radio sets, and to improvise furniture. Their cells are unlocked from 7 A.M. to 8.15 P.M.; they associate freely with each other and can make use of a library, reading-room, and games room. They can write and receive more letters than ordinary prisoners, and may be visited once a week.

But one great defect of the system, as it developed under the 1908 Act, was that work was too scarce to occupy the attention of prisoners, or to teach them diligence or develop their latent skills; as the report of the Departmental Committee on Persistent Offenders put it, in 1932, it was an empty life, with little to stimulate interest or mental activity. Discharge was at the discretion of an advisory committee composed of intelligent laymen—the same type of people (and often the same people) as become members of prison visiting committees. Mr. MORRIS notes that in 1921–31 the beginnings of a rigid system of release were perceptible, prisoners as a rule being discharged conditionally a few months after serving three-quarters of their sentence.

The great weakness of the Act, however, was its failure to net the real professional criminals—those whom Mr. HERBERT GLADSTONE, in presenting the Bill, had described as "men with an object, sound in mind—so far as a criminal could be sound in mind—and in body, competent, often highly skilled, and who deliberately, with their eyes open, preferred a life of crime and knew all the tricks and turns and manœuvres necessary for that life." What in fact the Act did catch is revealed in Mr. MORRIS's analysis of the cases of 32 preventive detainees—the total number undergoing this form of sentence when the Criminal Justice Act was passed in 1948.

> Their ages ranged from 35 to 65, but they were mostly elderly men, each with an average of about 15 previous sentences behind him. Mentally they were, in the main, not very bright, and were emotionally starved, apathetic, trained to rely on others, and quite incapable of holding down an outside job, though some of them had repeatedly tried to do so. In any case, physical disabilities and ailments were common among them, being severe enough in 12 to make regular work an absolute or relative impossibility. None of them was happily married or living under stable conditions before his last conviction.

11. Hertzler, A. E. Ventures in Science of a Country Surgeon. 1944.
12. London: Published for the London School of Economics and Political Science, by Longmans, Green & Co. 1951. Pp. 395. 27*s*. 6*d*.

Their crimes were largely of the nuisance type, mostly larcenies, housebreaking, vagrancy offences, begging, frauds, and the receiving of stolen goods. The correlation between their periods of imprisonment and their periods of freedom indicated that punishment had had no deterrent effect on their behaviour.

This is a picture of a group whom the Prison Commissioners have described as "generally harmless and elderly men whose sole aim is to lead a quiet life"; and a quiet life was what preventive detention effectively provided. However, as Mr. MORRIS says, prison is hardly the place for the near-invalid and the near-certifiable. Life under supervision in a hostel would surely be a better and cheaper substitute.

Meanwhile, during the forty years between the two Acts, those bigger fish, the professional criminals, some 5000 of whom Mr. GLADSTONE had hoped to find in his catch, had escaped through a gap in the net; for before a sentence of preventive detention could be imposed the court had to comply with so many conditions (which Mr. MORRIS sets out) that the whole intention of the Act was thwarted. The gap has been mended by the Criminal Justice Act, 1948, and in future the courts will probably order preventive detention more often and for more appropriate people. Under this Act the longest sentence has been extended from 10 to 14 years, while the shortest remains at 5. The dual track system, however, has been replaced by a single track: the offender will be sentenced to preventive detention in lieu of, not in addition to, a sentence of another kind.

The new situation presents us with some fresh duties. In its dealings with offenders the law is like the medieval doctor with his patients—heroic, certainly, but weak on diagnosis, pathology, and ætiology, poorly informed about course and prognosis, and with a handful of remedies which have never been properly assayed. What, in truth, do we know about the nature and causes of habitual criminality, and of the heredity and environment which produce the habitual criminal? Mr. MORRIS has made a beginning in this study by analysing the qualities, characteristics and background of 270 confirmed recidivists, now likely candidates for preventive detention.

He classed as "confirmed recidivists" men who were at least 30 years old when sentenced to a minimum of 3 years' penal servitude, pursuant to conviction for an indictable offence, and who since attaining the age of 17 had been convicted of indictable offences punishable with imprisonment for 2 or more years on six separate occasions, and committed to borstal detention or imprisonment on four or more such previous occasions.

His 270 had been received into Wandsworth prison between July 1, 1946, and Sept. 30, 1948. Their crimes included attempted murder, wounding, violence, sexual offences, bigamy, brothel-keeping, cruelty to children or animals, burglary, robbery and extortion, larceny, frauds, receiving, arson, and coining—the commonest crimes being burglary and other thefts, frauds, and receiving. What kind of men fall into this pattern of serious crime?

Their ages ranged from 31 to 70, with an average of 41½. Their first sentences were received at ages 8–42, the average being 19 years 2 months. The average age at first imprisonment was 21 years; nearly 40% of them had been in prison before reaching that age. Mr. MORRIS suggests that it might be worth studying whether early imprisonment robbed prison of its deterrent value, and habituated youths to a criminal career, criminal associates, and a criminal standard of values. Twelve of these recidivists had been sentenced to imprisonment when aged 16, three at the age of 15.

Some account of the early lives of these men was obtained in 196 cases; 123 (nearly 70%) of them came from broken homes, and 48 of them were illegitimate or rejected children, or the children of alcoholic, insane, or grossly immoral or criminal parents. In a period of full employment 72% of the group had been unemployed at the time of their last crime. Of 141 who were married, 57 were living with their wives when out of prison; a further 50 were living, when arrested, with women who were not their wives, and 8 of these liaisons appeared to be lasting. Many cases were found in which the death of a wife or other break in the marriage had precipitated—or preceded—the start of, or relapse into, a life of crime. The physical condition of the group was much better than that of the preventive detainees, being good or fair in 210 of them, indifferent in 31, and poor in only 29. Most of them appeared to be normal mentally (no intelligence tests were possible) but 9 were borderline mental defectives and 40 showed evidence of psychopathic personality. Their prison behaviour was nearly always good. Once again, the correlation between the length of the periods of imprisonment and the periods of freedom indicated that punishment had not influenced criminal behaviour.

Mr. MORRIS suggests that it is time we knew more about the natural history of criminals and criminal behaviour. Follow-up studies of criminals would enable us to assess the effects of various punishments on various types of men at various ages, and to classify offenders accordingly. If the punishment is not only to fit the crime but to deter the offender from repeating it, the sentencing judge must have full information about the group to which the prisoner most nearly conforms. A series of prediction tables could be drawn up, Mr. MORRIS believes, in which the statistical probability of later conduct would be correlated with qualities, traits, circumstances, and previous punishments of offenders; and he ends his book with an offer of the data he has collected to any person, approved by the London School of Economics and the Prison Commissioners, who will pursue this urgent and promising line of research.

Canicola Fever

BROOM [1] has lately commented on the apparent rise in the incidence of *Leptospira canicola* infection in man. The disease in man was first described in 1934,[2] and in 1948 MINKENHOF [3] found records of only 98 cases. In contrast to this, between 70 and 80 confirmed cases have occurred in England and Wales during the past four years [4]; and similar increases have been noted in other countries—notably Germany.[5–14] Most workers agree that the true incidence has probably not increased, and that the rise in the number of cases reported is due partly to great improvement in diagnostic facilities and partly to more widespread appreciation of the variability of the signs and symptoms; for example, the presence

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2. Dhont, C. M., Klarenbeek, A., Schüffner, W. A. P., Voet, J. *Ned. Tijdschr. Geneesk.* 1934, **78**, 5197.
3. Minkenhof, J. E. *Lancet*, 1948, ii, 8.
4. Broom, J. C. *Brit. med. J.* Sept. 22, 1951, p. 689.
5. Günther-Kühne, H., Rimpau, W., Schubert, H. *Dtsch. med. Wschr.* 1949, **74**, 129.
6. Kindler, M., Schindler, R. *Zbl. Bakt.* 1949, **154**, 286.
7. Krämer, R., Wieland, O. *Ärztl. Forsch.* 1949, **3**, 460.
8. Wegener, F. *Dtsch. med. Wschr.* 1949, **74**, 1227.
9. Stahl, E., Tetzner, E. *Ibid*, 1950, **75**, 254.
10. Glattkowski, G. *Ibid*, 1950, p. 857.
11. Adam, W. *Städtehyg.* 1951, **1**, 214.
12. Hellwich, K. *Dtsch. GesundhWes.* 1950, **5**, 1140.
13. Steigner, K. Fr., Messerschmidt, T. *Z. ImmunForsch.* 1950 **108**, 37.
14. Primavesi, K. A. *Öffentl. GesundhDienst.* 1951, **13**, 231.

of canicola fever in man has lately been established in Cuba,[15] Puerto Rico,[16] Brazil,[17] Scotland,[18] Indonesia,[19] and Malaya.[20] Even now, however, a certain number of cases are discovered almost by chance,[1] so no useful estimate of the true incidence can be made; but it seems unlikely to be as high as 3 per 100,000 of population per annum, which is the figure suggested by STEIGNER and MESSERSCHMIDT.[13]

It is of course well known that *L. canicola* is primarily a parasite of dogs, and that after clinical recovery from the illness the animals continue for a time to excrete leptospires in the urine. The carrier state is generally believed to persist for rather less than a year, but BROOM [1] refers to unpublished work by G. L. MONTGOMERY and W. I. M. MCINTYRE who demonstrated leptospires in the kidneys of dogs $4^1/_2$ years after apparent cure of the disease. This observation is of special importance in view of the efficacy of penicillin in the acute stages of canicola fever in dogs,[21] because it was later found [22] that penicillin does not prevent the colonisation of the renal tubules and the development of the carrier-state. Complete eradication can, however, be achieved even in chronic infections by administering streptomycin.[22] It seems probable, though no records have yet been published, that the same treatment would be effective in healthy carriers. It is impossible even to conjecture what proportion of dogs may be healthy carriers, since the condition is not likely to be suspected unless the animal transmits the infection to man. In all likelihood, however, the rate is high, because serological surveys have proved that 25–40% of dogs become infected at some time in their life. In man the disease is most often contracted by direct contact with infective dog's urine. Infection can also be acquired by bathing in contaminated fresh-water pools; PRIMAVESI [14] has described 8 cases in children who had bathed in a muddy pond along with two dogs; the serum of both animals contained agglutinins for *L. canicola*, but no further proof that they were carriers is adduced. Such evidence is not always easily obtained; for example, BROOM [1] states that *L. canicola* was isolated from a suspect dog by injecting a suspension of its kidneys into hamsters, after repeated microscopical examination and inoculation of its urine had failed to reveal the organism.

Because of the mode of transmission sporadic cases are the rule; and multiple cases, even in one household, are rare except when the nursing of a sick dog has been shared by two or more members of a family.[1 12 13 23] Epidemics of 39 and 28 cases have, however, been investigated in Germany. In one of these epidemics [13] contact with dogs was proved in every case, and the serum of all the surviving animals contained agglutinins for *L. canicola*. In the other epidemic [10] the first, explosive outbreak occurred among pea-harvesters, who were not accompanied by their dogs to the fields. GLATTKOWSKI [10] therefore suggests that some unidentified rodent may have been the carrier host. Certainly the epidemiology of canicola fever is not fully known, because cases undoubtedly occur in which the most searching inquiries fail to reveal any obvious source of infection from dogs. At present it is advisable to include canicola fever, and of course the non-icteric form of true Weil's disease, in the differential diagnosis of all cases of "pyrexia of unknown origin" especially if the symptoms include meningitis, nephritis, muscle tenderness, or injection of the conjunctivæ, and the history suggests any possible contact with the dejecta of dogs or rats.

Normally the disease is self-limiting—only 2 fatalities have been recorded [24 25]—and treatment is mainly symptomatic; but in view of the predilection of leptospires for the kidneys particular attention should be paid to the renal condition. It is difficult to assess the value of antibiotics in the treatment of the benign forms of leptospirosis; penicillin does not produce a dramatic improvement in man, as it does in dogs, and reports on the use of the newer antibiotics are too few to allow of any conclusions. To prevent transmission of infection from sick dogs to man, the owners should be warned of the risk and instructed how to disinfect the animals' dejecta. Fresh-water bathing-pools should be protected against both rats and dogs; chlorination is effective against leptospires as against other micro-organisms. When a case arises in man every effort should be made to trace the source of infection so that further spread can be averted.

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16. Boyer, C. I., Dammin, J. J., Reyes, F. M. *Puerto Rico J. publ. Hlth*, 1948, **24**, 177.
17. Correa, M. O. A., Meira, J. A. *Rev. med. cir. S. Paulo*, 1949, **9**, 185.
18. Joe, A., Sangster, G. *Edinb. med. J.* 1951, **58**, 140.
19. Wolff, J. W., Loman, S., Wielenga-Bergman, A. B. *Docum. neerl. indones. Morb. trop.* 1951, **3**, 187.
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24. Weetch, R. S., Colquhoun, J., Broom, J. C. *Lancet*, 1949, i, 906.
25. Wolff, J. W., van Dam, R., Minkenhof, J. E. *Ibid*, 1951, i, 1100.
26. Ravdin, I. S. *J. Amer. med. Ass.* 1951, **147**, 535.

Annotations

THE ETHICS OF SURGERY

THE responsibility of the surgeon to modern society was discussed at this year's annual session of the American Medical Association by Dr. I. S. Ravdin, chairman of the surgical section.[26] The problems he propounded are, as he said, not new; they are as old as the healing art itself. IF any professional group there will be some who do not maintain the ethical standard observed by the majority; but whereas in most occupations the results are usually felt in the end by the defaulters, in surgery the greatest sufferer may be the patient.

Overcharging and fee-splitting are faults with which Ravdin is much concerned. But what of operations that are unnecessary or have been advised on slender grounds? Apart altogether from avarice or the desire to earn a living, the temptation to resort to surgery is great. The technique of surgery was, for the most part, worked out by our forbears, but the high degree of safety with which it can now be practised is due, on the one hand, to the development of antibiotics, and, on the other, to the great advances in anæsthesia and restorative methods, such as blood-transfusion. Every corner of the body has become accessible, and the mechanical part of surgery has been very largely standardised. Shock can be eliminated, and restoration is easy. Hence a young surgeon, provided he is not ham-handed, can reasonably quickly gain the skill necessary to operate with certainty, accuracy, and expedition. The risks the older surgeon (or rather his patient) had to face have largely vanished. It is so easy to "look and see." Judgment, however, remains as necessary as ever: indeed it grows more necessary with each advance enabling us to alter the

structure of the body without immediate danger. At present, for example, we do not know much about the remote effects of extensive sympathectomy or of leucotomy, or of the huge operations now carried out for cancer; yet all these operations can be done by men who may not be qualified to judge their advisability in particular circumstances. The risk is always that the comparative ease with which technical surgical skill can be acquired and safely applied may lead to the training of men who are not of high enough calibre to take the vital decisions so often necessary in surgery. This risk increases as the specialties narrow in scope; for the more restricted the skill, the more readily it is learnt. If the men working in the specialties cease to possess and use a critical intelligence and wide knowledge, they are bound to be swayed by enthusiasts, with the result that unnecessary and unsuitable operations will become more numerous. In this way the narrowing of specialties, and their practice by men with merely technical skill, could bring surgery into disrepute.

The moral is clear—namely, that only men of good general education and sound principles are really suitable for training as surgeons. If we have the right students, and the right teachers, there will be no need to appeal, as Ravdin does, for adherence to a stricter ethical code.

MEDICAL EDUCATION IN THE U.S.A.

THE directors of the Commonwealth Fund, convinced that "medical education is approaching a new turning point," is allotting large resources to light the way. The fund's annual report for 1951[1] tells of present deficiencies in words which—allowing for our different methods—might have come from the heart of a medical teacher in Britain. It also tells, more cheerfully, of tentative steps to bring medical education into line with present-day needs.

No-one, says the report, would claim that medicine alone determines the health of the people, or that the physician alone can carry the responsibility for it. Yet the doctor remains the key figure in man's effort to conserve vigour, escape illness, and postpone death. If the social engineer whom some social scientists hope for should come into being, he may supersede the physician as the strategist of society's campaign for health; but the doctor is likely to remain for a long time its tactician and field commander. Tactics rest on technology, and doctors must have the best possible technological training; but a good technologist is not necessarily a good tactician, and if the medical schools are to teach their students how to deploy all the resources of medicine they must teach something more than technology. It is the effort to see clearly what this something more should be, and then how to provide it, that gives rise to the anxious questions that now beset medical educators. One question is whether the right people are reaching the medical schools, how students should be chosen, and what previous educational experience they should have had. Another is how medical teaching can build on what the student brings with him, how the medical sciences can be woven together and related to the patient, and how the break between the "scientific" and "clinical" courses can be closed. Still another is how a sense of the relation between one person and another that lies at the heart of medicine can be carried through all this process; and how the student can see patients not as "cases" isolated in space and time but as individuals interacting continuously, as they grow up and grow old, with their own particular environments. A very pressing problem is how the medical school can demonstrate in practice the kind of medical care that students are exhorted to give—medical care that meets the patient's needs without sacrificing the values of specialised skills—and how, in providing such care, the medical school can relate itself to its own community.

In the U.S.A. the formal part of medical education is likely to cover a dozen years—four at college, four at the medical school, and four in hospital. Thus there are two sharp breaks; and "the student may lose his way at either of them." No matter how assiduously a boy devotes himself to "premedical" requirements he may fail to get into the medical school of his choice or indeed any medical school at all. Again, after four successful years at the medical school he may fail to get an internship that advances his professional growth.

> "Perhaps the medical school should clarify for the colleges and for their students (as well as for itself) its conception of the qualities which justify an undergraduate in considering himself a candidate for medical training, or even commit itself earlier than it does now to eventually admitting a particular student. Almost certainly it should take more responsibility for the graduate training of the doctors who under present circumstances must be turned over to good, bad, and indifferent internships at a wide variety of hospitals."

Furthermore, if the college could provide a setting in which the student could actually test his facility in observing people and relating himself to them, admission committees at medical schools would have more to work on, and the future doctor would have begun to get the kind of experience which is basic to medicine and which he needs to motivate all his technical studies. At one medical school young instructors who went out of their way to discover how first-year students were getting on were disturbed to find them so drugged by anxiety over rote-memory tasks that they had no curiosity left: the transition from college to medical school had been one of baffled disillusionment.

> ". . . other teachers at other schools have noted the damaging effect of some conventional medical instruction, which may amount to a sort of atrophy of common sense, a temporary loss of normal everyday reactions by reasonably intelligent boys and girls who are trying to assimilate too many poorly organised facts. The tougher minds among the students recover from this regressive experience more quickly than the others; some are permanently warped."

The student must not only learn and digest what he can of the medical sciences; he must also learn to deal with the individual patient. "It is easy for the student to see the ward as an album of diseases which the faculty has thoughtfully collected for him; to find in the outpatient service a kaleidoscope of diagnostic designs changing so frequently that they never quite seem real. He misses the rhythm and flow of the patient's life, and so he may never fully understand the background, the consequences, or the full significance of the diseases to which his attention is directed." In the U.S.A. medical schools are trying to give the student the new dimension in experience which he has been missing—either by extending the period during which he follows particular patients or families in or out of organised clinics, or by sending him to patients' homes. At Duke University, North Carolina, for example, senior students spend a fortnight or more working with a country doctor.[2] In the experiment being made by New York Hospital and Cornell Medical College senior clerkships in medicine, pædiatrics, and psychiatry, instead of following each other in series, are to run concurrently; so "instead of being successively a cub internist, a cub pædiatrician, and a cub psychiatrist, the student may learn to think of himself as a cub doctor." A clinic for comprehensive care is to be formed within the framework of the present outpatient service. As far as possible specialists will come to the patient and the student, so that the patient will be cared for as long as possible in the general clinic instead of being geographically and administratively

1. Commonwealth Fund: 33rd Annual Report, 1951. Published by the Fund, 41, East Fifty-seventh Street, New York, N.Y.

2. *New York Times*, Nov. 25.

shunted off rather soon to specialty and subspecialty clinics elsewhere in the hospital.

"This is an experiment in teaching. But it has important meanings for the patient. There are few medical centers where it is easy for a patient walking in the clinic door to be sure of thoughtful, complete, disinterested attention to his total health problem. Outpatient departments have a mixed ancestry and show its effects. . Insofar as the clinic in teaching hospitals has been a recruiting station for the wards, and a proving ground for doctors who want inpatient privileges, it has always been in danger of slighting patients who are not candidates for bed care. there are disturbing indications that far too many outpatient visits today are essentially fruitless. It is considerations like this which lead shrewd administrators who are planning new buildings to leave outpatient quarters without fixed partitions: the physical, administrative and professional structure of the O.P.D. is likely to change a good deal as medical schools round the next corner."

In a somewhat similar experiment at Denver General Hospital, the University of Colorado Medical School is to set up a clinic which will supplant the outpatient department and gradually replace the home care now given by city physicians. Once a patient of the clinic, the person who comes to it for help will be the responsibility of a permanent member of the staff. He will be examined and cared for by a student and a young doctor—a resident in training for general practice. If the patient is house-bound a member of the clinic staff will visit him. If he is admitted to hospital a member of the clinic staff will share, as far as possible, in his inpatient treatment and keep in touch with him after he is discharged. A single record will follow him throughout.

The report makes it clear that two trends are emerging. One is towards fitting medical education to the student—and especially education for general practice (a field in which our own schools are showing growing interest [3]). The second is towards fitting medical care to the patient. These trends have this in common—that the urge to integrate sectioned elements runs as a continuous thread through both.

DIGITALIS AS A DIURETIC

THE diuretic action of digitalis first drew Withering's attention to the drug's therapeutic potentialities; yet we are still doubtful as to how this action is exerted. Our ignorance on this aspect is equalled by our ignorance of the fundamental action of digitalis on the heart; but fortunately these lacunæ in our knowledge are mainly of theoretical interest.

It has usually been assumed that the diuretic effects of digitalis are secondary to improvement in the circulation of the patient with congestive heart-failure. Cushny,[4] for instance, stated that it was "secondary to the accelerated blood flow and is a result of the changes in the heart alone." Farber and his colleagues [5] studied the effect of intravenous digoxin on the glomerular filtration-rate and the renal plasma-flow in three groups of individuals: 10 with congestive heart-failure; 7 with œdema of non-cardiac origin; and 28 with neither cardiac nor renal disease. Digoxin caused a prompt and definite water and salt diuresis in the patients with congestive heart-failure. In several cases this occurred with little or no change in glomerular filtration-rate or in renal plasma-flow; in some the glomerular filtration-rate increased sufficiently after digoxin to account "mathematically" for the diuresis, but "the changes in renal hæmodynamics following digoxin were minimal compared with the drug's diuretic effect." Digoxin also induced slight diuresis in the patients with non-cardiac œdema and in those without œdema; this diuresis was not associated with changes in renal hæmodynamics, cardiac output, or venous pressure. In 3 patients without cardiac or renal disease, to whom deoxycortone acetate was given until œdema developed, the intravenous administration of digoxin caused a diuresis "not unlike that observed in cardiac patients." As the effect of digoxin on sodium excretion in non-œdematous patients suggests a direct action on the renal tubules, Farber and his colleagues suggest that "in view of digoxin's structural similarity to salt-retaining corticosteroids, it may perhaps compete with some desoxycorticosterone-like hormone acting on renal tubule cells."

3. See Scott, R. *Lancet*, 1950, ii, 695; leading article, *Ibid*, p. 689
4. Cushny, A. R. Text-Book of Pharmacology and Therapeutics. London, 1924.
5. Farber, S. J., Alexander, J. D., Pellegrino, E. D., Earle, D. P. *Circulation*, 1951, **4**, 378.

LLOYD ROBERTS: A RETROSPECT

A SPAN of 85 years gives a man time to see something of the way of the world; and David Lloyd Roberts so timed his span as to see a vast revolution in medicine. Mr. J. Johnston Abraham, in his Lloyd Roberts lecture [1] of 1948, reminds us that this man, who was born in 1835 (in the time of William IV) and died in 1920, saw the early days of anæsthesia and the beginnings of modern nursing; heard of a surgeon called Lister when he was about 35, and tried his methods successfully at the age of 40; watched surgery advance from amputations, ligature of arteries, and cutting for the stone to modern abdominal, thoracic, and neurological surgery; helped to develop modern gynæcology; saw the invention of the clinical thermometer, the dawn of bacteriology, vaccinotherapy, immunotherapy, and chemotherapy (when Ehrlich gave us 'Salvarsan'); lived long enough to hear of deficiency diseases and vitamins; and having started practice at the end of the Crimean War was still actively engaged in it at the end of the war of 1914–18.

By birthplace, Roberts was a Lancastrian from Stockport, but as his name indicates he was of Welsh descent. His father, a spinner, and his grandfather, a wheelwright, had little to bequeath him but their dexterity; and he started life as an errand boy in a chemist's shop. His training in medicine was by apprenticeship, after the manner of those days, his master being the surgeon-apothecary William Smith who taught surgery and anatomy at Dr. Turner's medical school, in Pine Street, Manchester. Roberts qualified in 1857 as M.R.C.S. and L.S.A.—the standard diplomas of good general practitioners in mid-Victorian days—and in 1858 he was appointed district surgeon in ordinary to St. Mary's Hospitals, Manchester. This hospital for women and children took in operative midwifery cases and had a big external maternity department in Salford, which he was appointed to run. The staff included Thomas Radford, who was advocating the proper use of cæsarean section at a time when this operation was universally condemned by the profession and Charles Clay, who had done the first successful ovariotomy in Europe, removing a 36 lb. cyst in ten minutes. These were courageous colleagues for the young man. Nevertheless, those were the days of septic surgery; and the arrival of anæsthesia had meant that many more patients were coming to the operating-table—and dying of sepsis—than had ever done so before. Lister published his first article on antiseptic surgery, in THE LANCET, in 1865; but though this great advance was welcomed on the Continent, and in Edinburgh, it was coldly rejected in London until twenty years later; the provinces saw the light many years ahead of the capital. Before 1875, Lund of Manchester had introduced antiseptic surgery to Lloyd Roberts who, by 1876, was writing shrewdly of puerperal septicæmia, in the first edition of his *Practice of Midwifery*:

"I believe . . . from personal observation that exposure of a puerperal patient to the contagion of scarlet fever does in many instances set up a train of symptoms which constitutes to all intents and purposes puerperal fever."

1. *Transactions of the Medical Society of London*, 1948-50, **46**.

He taught that doctors and midwives could carry the disease to their patients, and insisted that anyone engaged in dissection should keep clear of the lying-in room. He was also in advance of the times in advocating laparotomy in cases of ruptured tubal pregnancy. The first successful operation of the kind was done by Lawson Tait, in 1883. In those days the physician-accoucheur was not expected to undertake surgical procedures; at St. George's Hospital, as late as 1886, he was allowed to diagnose a case of retropelvic abscess, introduce the trochar into the vagina, find the right position, and hold it there: the surgeon had to do the operation by pushing the trochar through the abscess wall. Even when obstetricians had become more surgically minded and widened the scope of the gynæcological operations they were allowed to undertake, they were kept outside the abdomen: vaginal hysterectomy became a gynæcological operation but abdominal hysterectomy was reserved for the surgeon. Lloyd Roberts, like Lawson Tait, was among the provincial pioneers who as gynæcologists took the whole abdomen as their province.

In those days great doctors liked to affect oddity. Lloyd Roberts had his own brand—bluntness, meanness, and kindness are remembered as his outstanding qualities. He kept his Lancashire accent, called everybody "lad," and gripped anyone he was addressing by the lapel, pulling him to and fro. Long after the age of motor-cars—till a month before his death, indeed—he drove daily to his consulting-room in a one-horse brougham, wearing a top hat on the back of his head, and a plaid shawl over his shoulders, and sitting bolt upright. He collected old books, silver, glass, and pictures, most of which he left to the Manchester Museum and Art Galleries; but his library of rare books went to the Royal College of Physicians, of which he had become a member in 1868 and a fellow in 1878. He never married, and his large fortune was bequeathed to the Welsh National School of Medicine. "There are two ways of getting on," he used to say to his students: "You can be clever or you can be kind. Well you can always be kind."

RETROLENTAL FIBROPLASIA

IN 1942 Terry [1] first described blindness due to retrolental fibroplasia; and by 1949 other American workers had published large series of cases.[2] This disorder affects premature babies, in whom the incidence is high; it involves some 7% of infants weighing less than $4\frac{1}{2}$ lb. at birth and 12–15% of those weighing 3 lb. or less. The condition most commonly manifests itself at the age of about 4 weeks, but the onset may be delayed for as long as 6 months. The lesion is bilateral; and the initial change is at the periphery of the retinæ, which become raised and œdematous with tortuous and congested vessels. At this stage the condition is reversible, and recovery may take place spontaneously. More usually retinal separation develops; and a membrane composed of folds of the peripheral retina, new-formed blood-vessels, and embryonic connective tissue, forms a characteristic grey mass behind the lens, which at first remains clear. Posterior synechiæ and a shallow anterior chamber are commonly present, and a secondary glaucoma may necessitate removal of the globe.

As more cases were reported the disquieting fact emerged that the numbers of infants afflicted was increasing greatly. This proved to be a true increase and not an apparent one from an improving survival-rate or more accurate diagnosis. The latest figures reveal that in America retrolental fibroplasia accounts for almost one-third of the cases of blindness in children under school age. In this country and on the Continent, however, the incidence, though increasing, seems to be much lower. Moffatt,[3] for example, found only 12 cases in 119 blind children in six Sunshine Homes, and Crosse [4] found the condition in 4·2% of babies in the Birmingham area with a birth weight under 3 lb.

The cause of retrolental fibroplasia is still obscure. Maternal and environmental influences have provided few clues; but research into the metabolism and feeding of premature babies has given more encouraging results. At present the saving of life due to advances in the care of premature infants carries with it the disaster of an increase in the number of blind people.

POLIOMYELITIS IN THE FAMILY

NOBODY would publish four cases of influenza, or measles, or tonsillitis merely because they occurred in one family at about the same time. Yet in this issue (p. 1178) Dr. Kennedy records four such cases of poliomyelitis, and Mr. Jewers (p. 1163) four and possibly five of appendicitis. Why these are notable is, of course, because they are rare—the appendicitis series may even be unique. On the other hand, every practitioner has seen whole families laid low with influenza and perhaps with tonsillitis; and when measles is introduced into a house full of children only those protected by a previous attack or artificially immunised are likely to escape. It seems a safe deduction that influenza, measles, and tonsillitis can be highly contagious. But it would be rash to conclude that appendicitis is not contagious, even if we could be sure that three or even two cases hardly ever appear together in a family, because there are other possible explanations. Our methods of diagnosing appendicitis might be faulty; there might be one or more forms of appendicitis as yet unrecognised; or the causal organism might be faced by a vast racial immunity enabling most people to withstand its attacks if they act as healthy carriers for a while. A less fantastic reason for caution is that epidemics of streptococcal tonsillitis complicated by appendicitis are seen from time to time, and multiple cases may be no more rare than those of secondary mastoiditis.

The lack of information on familial appendicitis is heavily counterbalanced by the mass of data on this aspect of poliomyelitis. Thus, in the American epidemic of 1916, Lavinier and others [5] found that 8331 families had only one case each; 353 had two cases, 21 had three, and 4 had four cases. Since in those days the diagnosis was rarely made unless paralyses were present, the findings in this epidemic, which must have been as large as any of the subsequent ones, show that multiple cases were not so rare after all. In last week's issue, Dr. Tyrrell [6] reported a Lincolnshire outbreak involving a small town and some surrounding villages, the main incidence being on a housing estate near the village of Digby. Altogether there were 97 clinically confirmed cases, with 12 deaths. In the three epidemic months (July–September, 1950), 20 examples of multiple cases in a family were discovered, though these included illnesses compatible with poliomyelitis if they occurred in siblings of a known case. This study produced one particularly striking finding: three sisters with what can only have been a constitutional and hereditary susceptibility. In their families, 5 of the 15 people developed paralysis, including one sister's husband and two sons; whereas there were only 3 paralytic cases among the 58 members of neighbours' families exposed to infection. Tyrrell found 8 instances of a parent, brother, or first cousin of one of his cases having paralytic poliomyelitis at some other place or time. In the U.S.A. such familial suceptibility to paralytic poliomyelitis is well recognised.

By studying fæcal excretion of virus, using inoculation into the monkey's brain as a test, Francis [7] of Ann

1. Terry, T. L. *Amer. J. Ophthal.* 1942, **25**, 203.
2. Owens, W. C., Owens, E. V. *Ibid.* 1949, **32**, 1.
3. Moffatt, P. McG. *Proc. R. Soc. Med.* 1950, **43**, 223.
4. Crosse, V. M. *Ibid*, p. 232.
5. Lavinier, C. H., Freeman, A. W., Frost, W. H. *Publ. Hlth Bull. Wash.* 1918, no 91, p. 309.
6. Tyrrell, D. A. J. *Lancet*, Dec. 15, 1951, p. 1129.
7. Francis, T. Paper read at the 2nd International Poliomyelitis Conference, Copenhagen, September, 1951.

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8. Seabury, R. H. *Arch. Pediat.*, 1951, **68**, 270.
9. Luisada, A. A. *Circulation*, 1950, **2**, 872.

STEREOSCOPY

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1. Toller, P. A. *Phot. Jnr. J.* 1951, **91B**, 81.
2. Morison, J. E. *J. Phot. Soc.* 1951, **63**, 429.
3. Dudley, L. P. *Stereoptics: an Introduction*. London, 1951.

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Special Articles

A YEAR'S APPLICATIONS TO THE LONDON EMERGENCY BED SERVICE

G. F. ABERCROMBIE
M.D. Camb.

CHAIRMAN, EMERGENCY BED SERVICE COMMITTEE, KING EDWARD'S HOSPITAL FUND FOR LONDON

IN the year ended Sept. 30, 1951, the Emergency Bed Service (E.B.S.) received 66,467 applications for the admission of general acute cases, at its head office and four branches. From April to October inclusive these applications were handled with a satisfactory degree of success, about 90% of the cases being admitted to hospital, and the remaining applications withdrawn for one reason or another (see THE LANCET, Nov. 17, 1951, p. 932). In fact, for these seven months of the year the E.B.S. is mainly a machine for saving the busy general practitioner's time; only in the five months, November to March, is it fully engaged in the search for beds.

For a short period in January, 1951, the E.B.S. failed to find a bed for about 100 patients every day. In an endeavour to trace these winter difficulties to their source, the service has made a statistical survey of all the 24,292 applications received at the head office at Old Jewry in the year, and the results show clearly where the difficulties arise.

CLASSIFICATION

The applications have been classified into 18 categories, 6 of which—fractures, malignant disease, eye, skin, tuberculosis, and miscellaneous—account for a comparatively small number of cases and are therefore omitted from this summary. Two other categories—abortions, and other obstetric conditions—vary little in numbers from month to month and are also omitted. The remaining categories are grouped as follows:

(1) Respiratory diseases.

(2) Heart-diseases.

(3) Cerebral hæmorrhage and other diseases of the central nervous system.

(4) Other acute medical conditions, comprising diseases of arteries and veins; gastro-enteritis and dysentery; peptic ulcer; hæmorrhage not included under other headings; and unclassified.

(5) Acute surgical conditions.

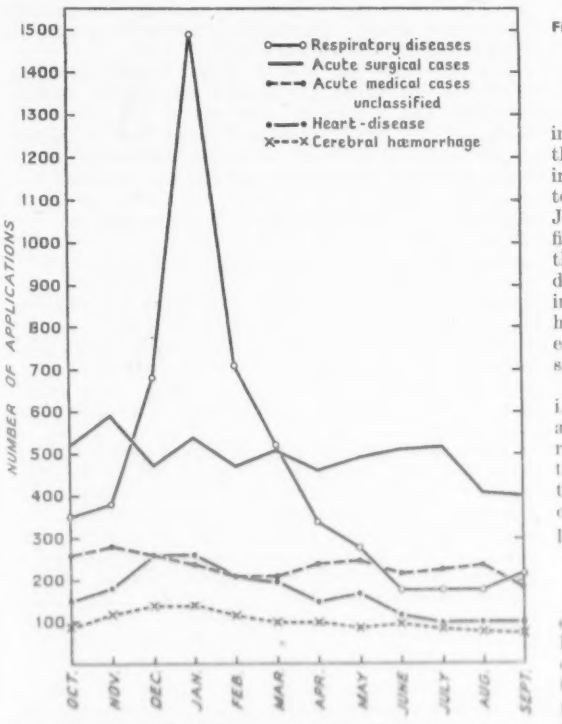

Fig. 1—Monthly applications for respiratory cases compared with those for other forms of illness.

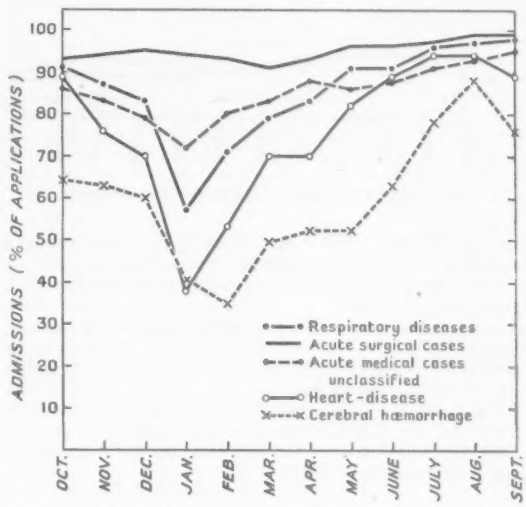

Fig. 2—Percentages of applications where admission to hospital was arranged.

FINDINGS

Fig. 1 shows the remarkable difference between the incidence of acute respiratory disease and the other three groups. This is the crux of the problem. Starting in December, applications for the admission of respiratory cases soar up, reaching a disproportionate peak in January, when the incidence is seven times the average figure for the summer, to fall again to normal by the end of March. In 1951 the January peak was no doubt accentuated by the onset of an influenza epidemic in that month. Neither the epidemic nor the season had much effect on the other groups shown in fig. 1, except heart-disease, which is responsible for a much smaller proportion of the applications.

The admission-rates for each of the same five groups—i.e., the percentage in which a bed is found on the day of application—are shown in fig. 2. Theoretically an admission-rate of 100% is possible, but in practice 90% represents the optimum normally attained. From fig. 2 it is evident that the greater demand for beds for acute respiratory cases makes it much harder to find beds for other medical patients, but does not affect surgical admissions.

NEEDS OF THE OVER-45s AND UNDER-5s

The findings throw some light on problems arising directly from the age of the patients seeking admission. Fig. 3 shows that applications for those over 45 years of age were much more numerous in winter than in summer; whereas there was no such difference for patients between 5 and 44 years. Children under 5 years, on the other hand, seem to need something like twice as many cots in winter as in summer. In both

shunted off rather soon to specialty and subspecialty clinics elsewhere in the hospital.

"This is an experiment in teaching. But it has important meanings for the patient. There are few medical centers where it is easy for a patient walking in the clinic door to be sure of thoughtful, complete, disinterested attention to his total health problem. Outpatient departments have a mixed ancestry and show its effects. . Insofar as the clinic in teaching hospitals has been a recruiting station for the wards, and a proving ground for doctors who want inpatient privileges, it has always been in danger of slighting patients who are not candidates for bed care. . there are disturbing indications that far too many outpatient visits today are essentially fruitless. It is considerations like this which lead shrewd administrators who are planning new buildings to leave outpatient quarters without fixed partitions: the physical, administrative and professional structure of the O.P.D. is likely to change a good deal as medical schools round the next corner."

In a somewhat similar experiment at Denver General Hospital, the University of Colorado Medical School is to set up a clinic which will supplant the outpatient department and gradually replace the home care now given by city physicians. Once a patient of the clinic, the person who comes to it for help will be the responsibility of a permanent member of the staff. He will be examined and cared for by a student and a young doctor—a resident in training for general practice. If the patient is house-bound a member of the clinic staff will visit him. If he is admitted to hospital a member of the clinic staff will share, as far as possible, in his inpatient treatment and keep in touch with him after he is discharged. A single record will follow him throughout.

The report makes it clear that two trends are emerging. One is towards fitting medical education to the student—and especially education for general practice (a field in which our own schools are showing growing interest [3]). The second is towards fitting medical care to the patient. These trends have this in common—that the urge to integrate sectioned elements runs as a continuous thread through both.

DIGITALIS AS A DIURETIC

THE diuretic action of digitalis first drew Withering's attention to the drug's therapeutic potentialities; yet we are still doubtful as to how this action is exerted. Our ignorance on this aspect is equalled by our ignorance of the fundamental action of digitalis on the heart; but fortunately these lacunæ in our knowledge are mainly of theoretical interest.

It has usually been assumed that the diuretic effects of digitalis are secondary to improvement in the circulation of the patient with congestive heart-failure. Cushny,[4] for instance, stated that it was "secondary to the accelerated blood flow and is a result of the changes in the heart alone." Farber and his colleagues [5] studied the effect of intravenous digoxin on the glomerular filtration-rate and the renal plasma-flow in three groups of individuals: 10 with congestive heart-failure; 7 with œdema of non-cardiac origin; and 28 with neither cardiac nor renal disease. Digoxin caused a prompt and definite water and salt diuresis in the patients with congestive heart-failure. In several cases this occurred with little or no change in glomerular filtration-rate or in renal plasma-flow; in some the glomerular filtration-rate increased sufficiently after digoxin to account "mathematically" for the diuresis, but "the changes in renal hæmodynamics following digoxin were minimal compared with the drug's diuretic effect." Digoxin also induced slight diuresis in the patients with non-cardiac œdema and in those without œdema; this diuresis was not associated with changes in renal hæmodynamics, cardiac output, or venous pressure. In 3 patients without cardiac or renal disease, to whom deoxycortone acetate was given until œdema developed, the intravenous administration of digoxin caused a diuresis "not unlike that observed in cardiac patients." As the effect of digoxin on sodium excretion in non-œdematous patients suggests a direct action on the renal tubules, Farber and his colleagues suggest that "in view of digoxin's structural similarity to salt-retaining corticosteroids, it may perhaps compete with some desoxycorticosterone-like hormone acting on renal tubule cells."

3. See Scott, R. *Lancet*, 1950, ii, 695; leading article. *Ibid*, p. 689
4. Cushny, A. R. Text-Book of Pharmacology and Therapeutics. London, 1924.
5. Farber, S. J., Alexander, J. D., Pellegrino, E. D., Earle, D. P. *Circulation*, 1951, **4**, 378.

LLOYD ROBERTS: A RETROSPECT

A SPAN of 85 years gives a man time to see something of the way of the world; and David Lloyd Roberts so timed his span as to see a vast revolution in medicine. Mr. J. Johnston Abraham, in his Lloyd Roberts lecture [1] of 1948, reminds us that this man, who was born in 1835 (in the time of William IV) and died in 1920, saw the early days of anæsthesia and the beginnings of modern nursing; heard of a surgeon called Lister when he was about 35, and tried his methods successfully at the age of 40; watched surgery advance from amputations, ligature of arteries, and cutting for the stone to modern abdominal, thoracic, and neurological surgery; helped to develop modern gynæcology; saw the invention of the clinical thermometer, the dawn of bacteriology, vaccinotherapy, immunotherapy, and chemotherapy (when Ehrlich gave us 'Salvarsan'); lived long enough to hear of deficiency diseases and vitamins; and having started practice at the end of the Crimean War was still actively engaged in it at the end of the war of 1914–18.

By birthplace, Roberts was a Lancastrian from Stockport, but as his name indicates he was of Welsh descent. His father, a spinner, and his grandfather, a wheelwright, had little to bequeath him but their dexterity; and he started life as an errand boy in a chemist's shop. His training in medicine was by apprenticeship, after the manner of those days, his master being the surgeon-apothecary William Smith who taught surgery and anatomy at Dr. Turner's medical school, in Pine Street, Manchester. Roberts qualified in 1857 as M.R.C.S. and L.S.A.—the standard diplomas of good general practitioners in mid-Victorian days—and in 1858 he was appointed district surgeon in ordinary to St. Mary's Hospitals, Manchester. This hospital for women and children took in operative midwifery cases and had a big external maternity department in Salford, which he was appointed to run. The staff included Thomas Radford, who was advocating the proper use of cæsarean section at a time when this operation was universally condemned by the profession and Charles Clay, who had done the first successful ovariotomy in Europe, removing a 36 lb. cyst in ten minutes. These were courageous colleagues for the young man. Nevertheless, those were the days of septic surgery; and the arrival of anæsthesia had meant that many more patients were coming to the operating-table—and dying of sepsis—than had ever done so before. Lister published his first article on antiseptic surgery, in THE LANCET, in 1865; but though this great advance was welcomed on the Continent, and in Edinburgh, it was coldly rejected in London until twenty years later; the provinces saw the light many years ahead of the capital. Before 1875, Lund of Manchester had introduced antiseptic surgery to Lloyd Roberts who, by 1876, was writing shrewdly of puerperal septicæmia, in the first edition of his *Practice of Midwifery*:

"I believe . . . from personal observation that exposure of a puerperal patient to the contagion of scarlet fever does in many instances set up a train of symptoms which constitutes to all intents and purposes puerperal fever."

1. *Transactions of the Medical Society of London*, 1948-50, **46**.

He taught that doctors and midwives could carry the disease to their patients, and insisted that anyone engaged in dissection should keep clear of the lying-in room. He was also in advance of the times in advocating laparotomy in cases of ruptured tubal pregnancy. The first successful operation of the kind was done by Lawson Tait, in 1883. In those days the physician-accoucheur was not expected to undertake surgical procedures; at St. George's Hospital, as late as 1886, he was allowed to diagnose a case of retropelvic abscess, introduce the trochar into the vagina, find the right position, and hold it there: the surgeon had to do the operation by pushing the trochar through the abscess wall. Even when obstetricians had become more surgically minded and widened the scope of the gynæcological operations they were allowed to undertake, they were kept outside the abdomen: vaginal hystereotomy became a gynæcological operation but abdominal hysterectomy was reserved for the surgeon. Lloyd Roberts, like Lawson Tait, was among the provincial pioneers who as gynæcologists took the whole abdomen as their province.

In those days great doctors liked to affect oddity. Lloyd Roberts had his own brand—bluntness, meanness, and kindness are remembered as his outstanding qualities. He kept his Lancashire accent, called everybody "lad," and gripped anyone he was addressing by the lapel, pulling him to and fro. Long after the age of motor-cars—till a month before his death, indeed—he drove daily to his consulting-room in a one-horse brougham, wearing a top hat on the back of his head, and a plaid shawl over his shoulders, and sitting bolt upright. He collected old books, silver, glass, and pictures, most of which he left to the Manchester Museum and Art Galleries; but his library of rare books went to the Royal College of Physicians, of which he had become a member in 1868 and a fellow in 1878. He never married, and his large fortune was bequeathed to the Welsh National School of Medicine. "There are two ways of getting on," he used to say to his students: "You can be clever or you can be kind. Well you can always be kind."

RETROLENTAL FIBROPLASIA

IN 1942 Terry [1] first described blindness due to retrolental fibroplasia; and by 1949 other American workers had published large series of cases.[2] This disorder affects premature babies, in whom the incidence is high; it involves some 7% of infants weighing less than 4½ lb. at birth and 12–15% of those weighing 3 lb. or less. The condition most commonly manifests itself at the age of about 4 weeks, but the onset may be delayed for as long as 6 months. The lesion is bilateral; and the initial change is at the periphery of the retinæ, which become raised and œdematous with tortuous and congested vessels. At this stage the condition is reversible, and recovery may take place spontaneously. More usually retinal separation develops; and a membrane composed of folds of the peripheral retina, new-formed blood-vessels, and embryonic connective tissue, forms a characteristic grey mass behind the lens, which at first remains clear. Posterior synechiæ and a shallow anterior chamber are commonly present, and a secondary glaucoma may necessitate removal of the globe.

As more cases were reported the disquieting fact emerged that the numbers of infants afflicted was increasing greatly. This proved to be a true increase and not an apparent one from an improving survival-rate or more accurate diagnosis. The latest figures reveal that in America retrolental fibroplasia accounts for almost one-third of the cases of blindness in children under school age. In this country and on the Continent, however, the incidence, though increasing, seems to be much lower. Moffatt,[3] for example, found only 12 cases in 119 blind children in six Sunshine Homes, and Crosse [4] found the condition in 4·2% of babies in the Birmingham area with a birth weight under 3 lb.

The cause of retrolental fibroplasia is still obscure. Maternal and environmental influences have provided few clues; but research into the metabolism and feeding of premature babies has given more encouraging results. At present the saving of life due to advances in the care of premature infants carries with it the disaster of an increase in the number of blind people.

1. Terry, T. L. *Amer. J. Ophthal.* 1942, **25**, 203.
2. Owens, W. C., Owens, E. V. *Ibid*, 1949, **32**, 1.
3. Moffatt, P. McG. *Proc. R. Soc. Med.* 1950, **43**, 223.

POLIOMYELITIS IN THE FAMILY

NOBODY would publish four cases of influenza, or measles, or tonsillitis merely because they occurred in one family at about the same time. Yet in this issue (p. 1178) Dr. Kennedy records four such cases of poliomyelitis, and Mr. Jewers (p. 1163) four and possibly five of appendicitis. Why these are notable is, of course, because they are rare—the appendicitis series may even be unique. On the other hand, every practitioner has seen whole families laid low with influenza and perhaps with tonsillitis; and when measles is introduced into a house full of children only those protected by a previous attack or artificially immunised are likely to escape. It seems a safe deduction that influenza, measles, and tonsillitis can be highly contagious. But it would be rash to conclude that appendicitis is not contagious, even if we could be sure that three or even two cases hardly ever appear together in a family, because there are other possible explanations. Our methods of diagnosing appendicitis might be faulty; there might be one or more forms of appendicitis as yet unrecognised; or the causal organism might be faced by a vast racial immunity enabling most people to withstand its attacks if they act as healthy carriers for a while. A less fantastic reason for caution is that epidemics of streptococcal tonsillitis complicated by appendicitis are seen from time to time, and multiple cases may be no more rare than those of secondary mastoiditis.

The lack of information on familial appendicitis is heavily counterbalanced by the mass of data on this aspect of poliomyelitis. Thus, in the American epidemic of 1916, Lavinier and others [5] found that 8331 families had only one case each; 353 had two cases, 21 had three, and 4 had four cases. Since in those days the diagnosis was rarely made unless paralyses were present, the findings in this epidemic, which must have been as large as any of the subsequent ones, show that multiple cases were not so rare after all. In last week's issue, Dr. Tyrrell [6] reported a Lincolnshire outbreak involving a small town and some surrounding villages, the main incidence being on a housing estate near the village of Digby. Altogether there were 97 clinically confirmed cases, with 12 deaths. In the three epidemic months (July–September, 1950), 20 examples of multiple cases in a family were discovered, though these included illnesses compatible with poliomyelitis if they occurred in siblings of a known case. This study produced one particularly striking finding: three sisters with what can only have been a constitutional and hereditary susceptibility. In their families, 5 of the 15 people developed paralysis, including one sister's husband and two sons; whereas there were only 3 paralytic cases among the 58 members of neighbours' families exposed to infection. Tyrrell found 8 instances of a parent, brother, or first cousin of one of his cases having paralytic poliomyelitis at some other place or time. In the U.S.A. such familial suceptibility to paralytic poliomyelitis is well recognised.

By studying fæcal excretion of virus, using inoculation into the monkey's brain as a test, Francis [7] of Ann

4. Crosse, V. M. *Ibid*, p. 232.
5. Lavinier, C. H., Freeman, A. W., Frost, W. H. *Publ. Hlth Bull. Wash.* 1918, no 91, p. 309.
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8. Scobey, R. R. *Arch. Pediat.* **1951**, **68**, 220.
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In the newest system, adopted at the South Bank Exhibition's "Tele-cinema," which has outlived the exhibition itself, each of the two superimposed images is projected and viewed through a polarising filter with its axis at right angles to the other, so that each eye sees only one image. This system has disadvantages of its own: only about a sixth of the light generated reaches the viewer's eye, and the metallic screen used leads to an even greater loss of brilliance when the images are viewed obliquely, as from the sides of the cinema. Nevertheless, the system is gaining ground for teaching purposes, where the audience is often small and its members can provide their own viewing spectacles. Stereoscopy has many potential uses in medical teaching. Three-dimensional records are more informative than ordinary photographs, especially with small objects and pathological specimens, as Toller [1] lately demonstrated to the medical group of the Royal Photographic Society. Objects small enough to require low-power magnification present additional problems in stereoscopic recording. Morison [2] uses a lathe-bed to provide the small movements of the camera needed under these exacting optical conditions. Neither linear movement nor rotation of the object can be effective substitutes for moving the camera, since they also alter the lighting; and twin-lens work is impossible because the separation required for the two viewpoints will often be less than the diameter of the lenses in use. Before stereoscopy can become popular again the viewing system must be improved. New techniques are coming along, and Dudley [3] discusses the theory and practice of various methods for showing an audience three-dimensional pictures without any personal seeing-aids. These methods are mainly experimental, and many are costly to install, but their successful application will be a great step forward in visual presentation. Stereoscopy should then return to favour and might even put single-lens projection out of business.

Dr. H. S. RAPER, F.R.S., professor of chemical physiology in the University of Manchester and dean of the medical school, died on Dec. 12 at the age of 69. He was to have retired at the end of this month.

1. Toller, P. A. *Photogr. J.* 1951, **91B**, 81.
2. Morison, J. E. *J. Path. Bact.* 1951, **63**, 429.
3. Dudley, L. P. Stereoptics: an Introduction. London, 1951.

Special Articles

A YEAR'S APPLICATIONS TO THE LONDON EMERGENCY BED SERVICE

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M.D. Camb.

CHAIRMAN, EMERGENCY BED SERVICE COMMITTEE, KING EDWARD'S HOSPITAL FUND FOR LONDON

IN the year ended Sept. 30, 1951, the Emergency Bed Service (E.B.S.) received 66,467 applications for the admission of general acute cases, at its head office and four branches. From April to October inclusive these applications were handled with a satisfactory degree of success, about 90% of the cases being admitted to hospital, and the remaining applications withdrawn for one reason or another (see THE LANCET, Nov. 17, 1951, p. 932). In fact, for these seven months of the year the E.B.S. is mainly a machine for saving the busy general practitioner's time; only in the five months, November to March, is it fully engaged in the search for beds.

For a short period in January, 1951, the E.B.S. failed to find a bed for about 100 patients every day. In an endeavour to trace these winter difficulties to their source, the service has made a statistical survey of all the 24,292 applications received at the head office at Old Jewry in the year, and the results show clearly where the difficulties arise.

CLASSIFICATION

The applications have been classified into 18 categories, 6 of which—fractures, malignant disease, eye, skin, tuberculosis, and miscellaneous—account for a comparatively small number of cases and are therefore omitted from this summary. Two other categories—abortions, and other obstetric conditions—vary little in numbers from month to month and are also omitted. The remaining categories are grouped as follows:

(1) Respiratory diseases.

(2) Heart-diseases.

(3) Cerebral hæmorrhage and other diseases of the central nervous system.

(4) Other acute medical conditions, comprising diseases of arteries and veins; gastro-enteritis and dysentery; peptic ulcer; hæmorrhage not included under other headings; and unclassified.

(5) Acute surgical conditions.

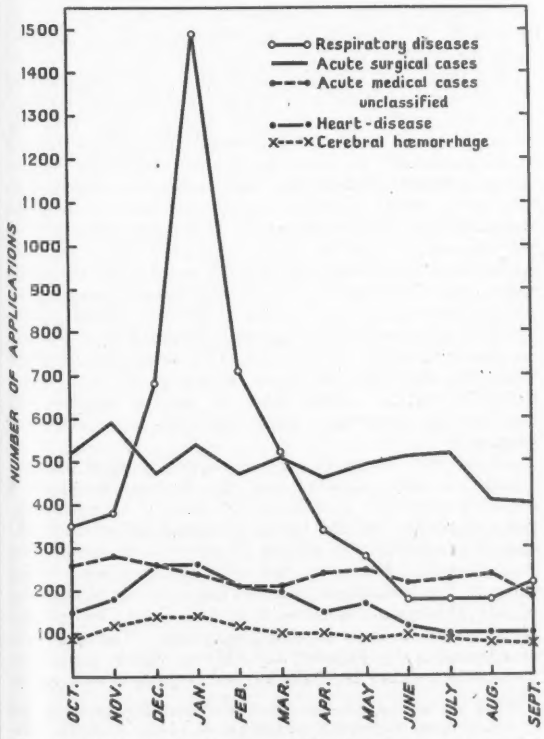


Fig. 1—Monthly applications for respiratory cases compared with those for other forms of illness.

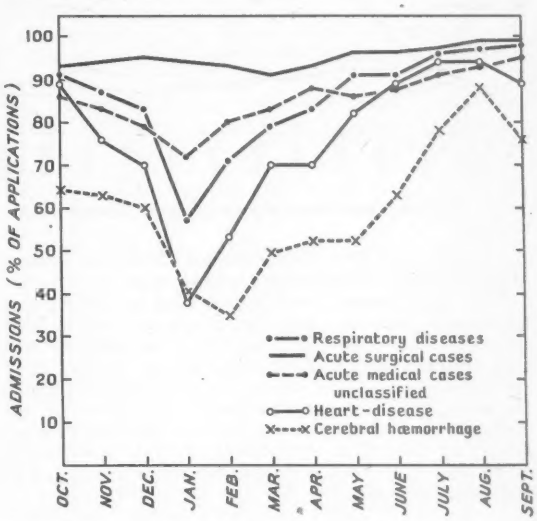


Fig. 2—Percentages of applications where admission to hospital was arranged.

FINDINGS

Fig. 1 shows the remarkable difference between the incidence of acute respiratory disease and the other three groups. This is the crux of the problem. Starting in December, applications for the admission of respiratory cases soar up, reaching a disproportionate peak in January, when the incidence is seven times the average figure for the summer, to fall again to normal by the end of March. In 1951 the January peak was no doubt accentuated by the onset of an influenza epidemic in that month. Neither the epidemic nor the season had much effect on the other groups shown in fig. 1, except heart-disease, which is responsible for a much smaller proportion of the applications.

The admission-rates for each of the same five groups—i.e., the percentage in which a bed is found on the day of application—are shown in fig. 2. Theoretically an admission-rate of 100% is possible, but in practice 90% represents the optimum normally attained. From fig. 2 it is evident that the greater demand for beds for acute respiratory cases makes it much harder to find beds for other medical patients, but does not affect surgical admissions.

NEEDS OF THE OVER-45s AND UNDER-5s

The findings throw some light on problems arising directly from the age of the patients seeking admission. Fig. 3 shows that applications for those over 45 years of age were much more numerous in winter than in summer; whereas there was no such difference for patients between 5 and 44 years. Children under 5 years, on the other hand, seem to need something like twice as many cots in winter as in summer. In both

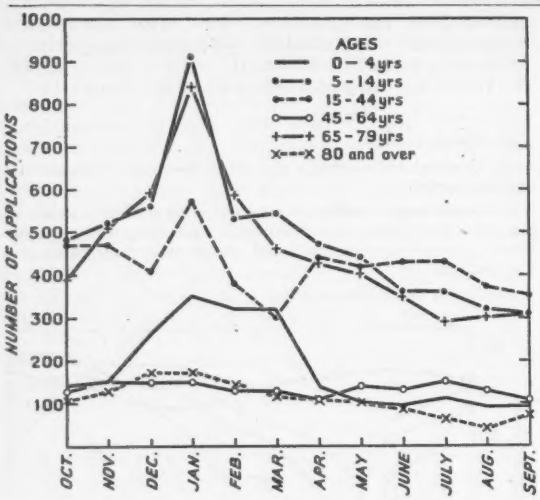


Fig. 3—Age-distribution of applications for admission.

the over-45 and under-5 age-groups the winter demand is almost wholly due to respiratory diseases.

There is, of course, nothing startling in finding that respiratory illnesses are commoner in winter than summer. But it may help hospital authorities to meet this winter's calls on their beds if they see how great an increase in respiratory disease is to be expected among the older and youngest patients. Yet, even in the critical period of an epidemic, each of the 200 hospitals served by the E.B.S. need admit only one more patient every other day to close the gap between the demand for beds and the supply.

ROYAL COLLEGE OF SURGEONS

PRINCESS ELIZABETH visited the college on Dec. 5, when Sir CECIL WAKELEY, the president, admitted her to the honorary fellowship. The Princess was introduced by Mr. P. H. MITCHINER and Sir JAMES PATERSON ROSS, the vice-presidents of the college. Mr. Mitchiner said that the fellows and members of the college were dedicated to the service of the British public and this established common ground between them and their new fellow. In her reply PRINCESS ELIZABETH said that nowadays we heard much of the evils to which man has put his new-found scientific knowledge, but surgery, she continued, "is at least one field in which man's wisdom and energies have been devoted consistently for human good; here the new discoveries of science have been bent wholly on saving life and not on destroying it, on relieving suffering, and on healing. That surely is a thought full of hope and promise, not only for the sick but for all who believe in human progress."

MEETING OF FELLOWS AND MEMBERS

The informal meeting of fellows and members was held on Dec. 12 when Sir CECIL WAKELEY announced in his presidential address that an Institute of Basic Medical Sciences had been formed as a faculty of the college and an institute of the British Postgraduate Medical Federation.

Sir STANFORD CADE, chairman of the building committee, said that the first stage of the rebuilding would start on Jan. 1. He paid a tribute to Lord Webb-Johnson for his part in initiating the scheme. When completed it would be a monument worthy of the great surgeons who had occupied the presidential chair of the college.

Sir MAX PAGE, chairman of the finance committee, stressed that money was still needed for capital and for income. It was agreed that the first call was for more capital for the restoration fund. The first tender for work was for nearly £500,000; so at least £300,000 more was needed for this fund. Turning to income Sir Max said that this year the college expected a deficit of £13,000. When the new college was built, if the income remained the same, the deficit would be £30,000 or £40,000. This had to be made good. The annual meeting last year agreed that examination fees could not be increased; tuition fees must be as low as possible; receipts from the Conjoint examinations were likely to fall.

The PRESIDENT remarked that newer bodies were able to profit from the experience of older ones. The Royal College of Obstetricians and Gynæcologists, for instance, had an annual subscription. A subscription of 10s. from each member and £1 a year from each fellow would help their own college; they could not demand it, but they would like to suggest it. He paid tribute to what members and fellows had already done in raising money.

Personal Papers

CHRISTIANITY AND MEDICINE*

By the late
SIR JOSEPH BARCROFT
C.B.E., F.R.S.

IF medicine is the art of curing disease, whether of mind or body, there can surely be no difficulty in reconciling this effort to restore the body to health with Christianity, for the simple reason that such a practice was one of the major activities of our Lord. In so far as Christianity may be defined as following the example of Christ, this effort to reduce the bodily ills of mankind may be regarded as almost a duty.

We may well ask what it is that needs reconciling. To the doctors of my youth there was little or nothing. Medicine was empirical. The doctor came into the sickroom; he made a diagnosis; he said to himself "old Greenfield (or someone else at whose feet he had sat as a student) found that such and such a prescription was very useful in such cases." He wrote down the prescription; the bottle came; if the patient improved all was well, if not he tried something else. All this, as long as it was done in good faith, required no reconcilement with Christianity; the trouble became more widespread when the doctor began to interest himself in the physical processes which underlay his remedies. So long as these concerned merely the body there was no great difficulty, but when the mind became involved it was a different matter. Men began to ask to what extent our mental processes were simply a matter of chemistry?

As one who has written a book a great part of which is concerned with pointing out the degree to which a person's mentality is affected by trifling alterations in the composition of his blood, I cannot completely disclaim responsibility of adding to this uneasy intellectual ground-swell. Moreover, my own observations, unlike those of the endocrinologists, do not involve the addition of any abnormal constituents to the blood, but merely an alteration in their normal proportion. The discovery of adrenaline by Schafer and Oliver, which seemed at first to be related to little beyond objective changes in

* From an address to the Student Christian Movement at Newnham College, Cambridge, on Dec. 5, 1944. The manuscript was found among the papers at his bedside after his death.

blood-pressure, has culminated in a book by Walter Cannon called *Hunger, Fear, Rage and Pain*. But adrenaline was only the first of the hormones to be discovered. It has been followed by the so-called sex hormones, which are not unlikely to affect man's mentality as well as his physical appearance.

I have seen quite amicable people, when living at a height of 15,000 feet or so, become troublesome, garrulous, or morose. This may be the result of oxygen deficiency; and it is well known that a trifling but inexorable oxygen deficiency, spread over a long time, will completely alter character and outlook. If, then, our mental processes are servants of our blood, if our desires and even our lusts are merely the necessary manifestations of this or that hormone in our circulation, what becomes of moral responsibility? And, if moral responsibility goes, what becomes of Christianity as a working hypothesis in our lives?

MIND AND BODY

So we arrive at the somewhat threadbare, but none the less fundamental, subject of this relation of mind to body; for, whatever the soul may be, if the mind and body are separate entities, the soul is more likely to be a function of the mind, as divorced from the body, than of the body divorced from the mind.

On the relation of the mind to the body the person whose opinion I trust more than that of any other is Sir Charles Sherrington. On the one hand, his knowledge of the nervous system is admittedly unrivalled and wholly objective; on the other hand, unlike many doctors, he is a psychologist also in the most objective sense. In his book *Man on His Nature*, the penultimate chapter, entitled Two Ways of Our Mind, deals with this question. Between these two "naked mind" and the "perceived world," is there nothing in common? Together they make up this sum total of us: they are all we have. Can they in no wise be brought together? They have this in common—and we recognise it—they are both conceptions. They are both parts of the knowledge of one mind. The idea of this link does not take us very far. In talking over these matters I have known Sir Charles to go much further; I recall two sentences uttered to me; one five or six years ago, the other quite recently; as nearly as I can quote them they were as follows:

"I can find no explanation of the mind in terms of the brain."

"I am in a sense a mystic, for any material explanation of the mind eludes me."

Let us start then with mind and a material brain, which have no link except that they are concepts. Whether concepts or not, I do not think Sir Charles would stand for the idea that the brain in the material world was merely a concept. Few of us really doubt that, were man and his concepts not on this earth, the earth would be here just the same—or nearly the same. And if we can extrapolate our concepts of the material universe in something real, we are at liberty to explore the possibilities of extrapolation of mind, "the thinking I," as Sherrington would call it, in the opposite direction.

When, on the other hand, the mind concept is applied so as to insert into the human individual an immortal soul, again a trespass is committed. The very concomitance of the two concepts, which seems a basal condition of our knowledge of them, is thrown aside as if forgotten. Such amplifications of this one concept (presumably mind) may be legitimate for a revealed religion—the evidence then rests upon ground we do not enter upon here. That is to say, this evidence for an expansion of mind into soul is not to be looked for in this region, in this study of the structure of material things.

It may not be amiss here to say a few words descriptive of the mind as conceived along materialistic lines, the alternative in fact to Professor Sherrington's "thinking I." The material conceives us as robots. The mind is a piece of machinery; as it might be the exchange of a dialling telephone system. The human action is a series of reflexes. We are like infinitely complicated clocks. One is wound in a single place and it tells the time of day. The other I wind in two places and it strikes as well. My friend Professor Torrens would make one which wound in a third place and a column of fluid would go up and down telling the rise and fall of the tide. But these clocks are all simple, inasmuch as they are all wound by the human hand. The materialistic conception envisages minds as clocks wound perpetually, mostly by other clocks, with no prime determining hand. It envisages society as a waste of clocks all winding one another.

So then, if mind is to have contacts other than with material mechanisms it must not seek the evidence for them in the direction of these mechanisms but elsewhere. Surely it is not debarred from such a search. In short, seek ye the Lord where he may be found, not in the fire or the whirlwind but in the still small voice.

THE SCIENTIST'S STANDPOINT

Here so far from being hindered by the fact that we are scientists we are helped, and that in two ways:

1. Seeking—that is to say, the use of experiment to discover the to us unknown—is the essence of scientific research.

2. Failure in experiment is the ladder which leads ultimately to success.

But seeking is in itself an act of faith, it is the starting on a road. It is a negation in terms to start a journey along a road which you are convinced leads nowhere: seeking may not be an act of great faith, but at least it contemplates the possibility of a goal.

The scientist, too, is at a great advantage because his studies force upon him an appreciation of his own ignorance. To reach a complete system of knowledge, in which each part articulates perfectly into every other part, like the parts of a jig-saw puzzle making at the end a flawless intellectual whole, is something quite foreign to his experience. That one ascertained fact should appear to clash with another one is quite within it. The scientist is, as it were working in the groove of some scratch in an immense crystal with an infinite number of facets. He is probably well content to make a sure ascent of some portion of the wall of the groove, but even if he arrived at the top he would only see the surface of a single facet; other facets point in different and opposite directions. To him the point is that his experiments should be sacred as far as they go, not that they should be all embracing.

Granting then that we are free to experiment, what is the experiment to be? One of the greatest scientific men of todày said to me once "I have a congenital objection to doing experiments at random," and it will be the experience of all that the proper planning of our experiments is a great factor in their success. For direction we naturally turn to the Bible as being, if I may use the term reverently, our textbook. The experiment is to contact God and to maintain that contact. The mere performance of that experiment is, as we have seen, itself an act of faith; let us then take the following words: "I am the way, the truth and the life. No man cometh unto the father but by me"; "Building up yourselves on your most holy faith, praying in the Holy Spirit, keep yourselves in the love of God, looking for the mercy of our Lord Jesus Christ unto Eternal life." How then is this act of faith to proceed, what meaning can we assign to that phrase?

Does it not mean the spirit in which Christ himself prayed. "Not my will but Thine be done."

The presentation of Christianity which I have put before you offers little about dogmatic theology. The terms Father, Son, Holy Ghost, in so far as they are used with any material connotation, and Immaculate Conception, and Resurrection of the Body find no place in what I have said. Discussion of this kind would mean seeking evidence of revealed religion in the mind-energy complex. Our mental outlook is in the opposite direction.

But it does offer much with regard to the difference between right and wrong. Thine ears shall hear a word behind thee, saying, "This is the way, walk ye in it." Where does that voice come from? Can it be the striking of a material clock wound by the other innumerable material clocks? Can it be the realisation of that experimental act of faith which probed out towards the promise that those that seek me diligently shall find me?

Public Health

FOUR CASES OF ACUTE POLIOMYELITIS IN THE SAME FAMILY

JOSEPH MORROW KENNEDY
M.B. Belf., D.P.H.

LECTURER ON INFECTIOUS DISEASES IN THE UNIVERSITY OF SHEFFIELD; PHYSICIAN-SUPERINTENDENT, LODGE MOOR HOSPITAL, SHEFFIELD

IT is not unusual for two or even three members of the same family to develop poliomyelitis; but for four to do so is rare, at least in this country.

THE FAMILY

Alpha, aged 5, Beta, aged 7, and Gamma, aged 10, were brothers and the only children of the family. They dwelt with their parents in a house in the south-west part of the city, and all three attended the same school

Delta, a boy of 11, an only child and a cousin of Alpha, Beta, and Gamma, lived with his parents in a house in the north-west part of the city, some three miles apart from his cousins, and attended a different school. It was the custom at the weekends for Delta, as an only child, to visit his cousins Alpha, Beta, and Gamma, and play with them.

On Sunday, Sept. 30, 1951, all four boys were together at the home of Delta, and nothing unusual was noticed about their health. They appeared quite normal and indulged in the usual juvenile games.

Alpha

On Monday, Oct. 1, Alpha attended school, and on his return home complained of headache, which persisted during the following day, Tuesday. On Wednesday, Oct. 3, his headache grew worse; during the afternoon he became listless and apathetic; and in the evening he was taken to the doctor's surgery. The doctor found neck rigidity and arranged for him to be taken to the Children's Hospital, where lumbar puncture was performed with the following findings:

About 3 ml. of silverish fluid. Cells 765 per c.mm., about 75% polymorphs. Protein 120 mg., and glucose 75 mg., per 100 ml. No organisms seen. Culture sterile.

Meningitis being suspected, penicillin 100,000 units three-hourly intramuscularly, and sulphadiazine 1 g. four-hourly, were given whilst he was a patient in the Children's Hospital.

On Thursday, Oct. 4, a second lumbar puncture was performed:

Cells 310 per c.mm. (polymorphs 70%, lymphocytes 30%). Protein 60 mg., glucose 78 mg., and chlorides 680 mg., per 100 ml.

Alpha had now developed weakness of the left leg, with diminished knee and ankle jerks and retention of urine. He was admitted on Oct. 4 to Lodge Moor Hospital, where lumbar puncture was performed on Oct. 10, with the following results:

Pressure normal. Clear fluid. Cells 26 per c.mm. (lymphocytes 96%, polymorphs 1%). Chlorides 720 mg., glucose 60 mg., and protein 90 mg., per 100 ml.

There was moderate flaccid paralysis of both legs, the left being more affected than the right. Alpha is still an inpatient undergoing treatment.

Gamma

On Thursday, Oct. 11, Gamma was admitted to Lodge Moor Hospital, having first felt ill on Oct. 10, with headache and backache. On admission his temperature was 101·6°F, pulse-rate 140, and respirations 20 a minute. Neck and spinal rigidity was present, all reflexes were brisk, and there was no sign of paralysis. Lumbar puncture was performed on Oct. 11, the second day of illness:

Pressure normal. Fluid faintly hazy. Cells 250 per c.mm. (lymphocytes 98%, polymorphs 2%). Chlorides 750 mg., glucose 55 mg., and protein 120 mg., per 100 ml.

His progress was quite satisfactory, and he was discharged home, quite fit, on Oct. 31.

Beta

Beta first felt ill on Wednesday, Oct. 10, with slight headache. Next day his headache was worse, and on Oct. 12 he was admitted to Lodge Moor Hospital, with temperature 99·4°F, pulse-rate 116, and respirations 20. He complained of severe headache. He had considerable neck and spinal rigidity, and all tendon reflexes were present. There was no sign of paralysis. Lumbar puncture was performed on Oct. 12, the third day of illness:

Pressure increased. Fluid clear. Cells 50 per c.mm., all lymphocytes. Glucose 720 mg., and protein 45 mg. per 100 ml.

His progress was quite satisfactory and he was discharged home, quite fit, on Oct. 31.

Delta

On his return from school on Tuesday, Oct. 9, Delta complained of headache, which became worse on Oct. 10, when he was kept in bed and the family doctor was called (a different doctor from the one attending Alpha, Beta, and Gamma). On Oct. 11 he became listless and apathetic, and was again visited by the doctor. On Oct. 12 he was mildly delirious, and his speech became thick and difficult. On Saturday, Oct. 13, he was admitted to Lodge Moor Hospital with temperature 99·8°F, pulse-rate 112, and respirations 22. He complained of severe headache. Much neck and spine rigidity was present. Lumbar puncture was performed on Oct. 13, the fifth day of illness:

Pressure normal. Fluid clear. Cells 140 per c.mm. (lymphocytes 80%, polymorphs 20%). Chlorides 730 mg., glucose 50 mg., and protein 95 mg., per 100 ml.

His speech was thick and slurring, and he had great difficulty in drinking. Excess mucus welled up in the oropharynx. The diagnosis was acute poliomyelitis, bulbar type, the 9th and 11th cranial nerves being involved.

He improved rapidly and normal speech and drinking returned. The only weakness was mild paralysis of the sternomastoid muscles. He was discharged home on Nov. 4.

DISCUSSION

Alpha, Beta, and Gamma attended a different school from their cousin Delta, and there had not been any cases of poliomyelitis at either school. The two families, living in different parts of the city, were attended by different doctors, neither of whom was aware of the illness in the other family.

Since there was no further contact, it can be assumed that on Sunday, Sept. 30, when all four boys were together, Alpha, being at the end of his incubation, was infectious and infected his two brothers and his cousin Delta. As Delta had no later contact with his cousins, his period of incubation was 10 days—from Sept. 30 until Oct. 9, when he first complained of a headache. For the brothers Beta and Gamma 11 days' incubation would be reckoned.

There were no other children in either household, and no history or suggestion of illness among the adults which may have represented an abortive attack of the malady. Two of the children had a non-paralytic attack of poliomyelitis, the third a spinal attack of moderate severity with paralysis of both legs, and the fourth a bulbar attack of mild degree, leading to weakness of the sternomastoid muscles.

SUMMARY

One boy infected two brothers and a cousin with acute poliomyelitis. No other case had been observed in either family or at either of the two schools attended by the boys.

Evidently the infecting boy was highly infectious towards the end of his incubation period. He developed the disease in paralytic form.

In the case of the cousin, the incubation period was 10 days. In the case of the two brothers it is reckoned at 11 days.

The two infected brothers had non-paralytic attacks, and the cousin had a paralytic bulbar attack.

Mortality from Cancer

In her report for 1950, Dr. Catherine Crane, medical officer of health for York, suggests that the essential features of a campaign to lower the cancer mortality-rate are as follows :

1. Education of the public in the signs and symptoms of early disease, with emphasis on the high percentage of cures with early treatment.

2. Coöperation with general practitioners and assistance in follow-up of doubtful cases.

3. Facilities for immediate admission to hospital of patients needing treatment or for diagnosis.

4. A national registration scheme such as was envisaged in section I of the Cancer Act, 1939, but repealed by the National Health Service Act, 1946.

" If," says Dr. Crane, " such a campaign were undertaken by local authorities throughout the country, the death rate from cancer could be lowered without waiting for the solution of the problem of causation. Cancer should undoubtedly be a major public health problem, and is well within the scope of preventive medicine."

" . . . The Health Service is not yet 100 per cent. efficient, but to achieve the maximum efficiency it is not necessary to increase expenditure. By cutting out non-essentials and by the establishment of a balanced system of priorities, covering the whole field of medical care, a much more effective and economical service could be achieved."—Dr. T. O. P. D. LAWSON, medical officer of health for Dudley, in his report for 1950.

In England Now

A Running Commentary by Peripatetic Correspondents

WE are able to disclose that the tracks seen and photographed recently on Mount Everest are not those of a bear or langur monkey but of a certain Miss Prout, who disappeared in somewhat mysterious circumstances when acting as governess to a Hill Rajah's family in the neighbourhood. Kipling refers to the incident in his collection of verse *Simla and Similar*—" Miss Prout, Who faded out, In O Nine, Or thereabout . . ."—and a passage in Farrer's notebooks supports this theory of the origin of the Abominable Snowoman—if we may coin a phrase—in which he describes rounding a rock in a hitherto untrodden Tibetan valley and descrying a scarlet patch in the middle of the cœrulean sheets of *Gentiana farreri*, which upon examination proved to be a copy of *Little Arthur's History of England*. Farrer had recently been converted to Buddhism and his publishers naturally suppressed the passage.

As to the tracks, at the time of her disappearance, which was believed to be due to advances from the Rajah whose purport no governess could mistake or approve, Miss P. was said to be wearing elastic-sided boots. A simple experiment will show that such boots, when their sides have been disintegrated by wear and weather, will produce similar impressions in virgin snow, while the single line of tracks, occupying the smallest possible space, is familiar to those who have studied professional gaits, as the *pas de gouvernante* (Charcot).

Miss Prout is, of course, a member of that branch of the Lincolnshire Prouts which moved to Ealing in the late 19th century.

* * *

I shall have to go on a pilgrimage. It all comes from thinking about Patrick Dalroy in Chesterton's *Flying Inn*—that great red-headed giant (" I come from Castlepatrick and me heart is on me sleeve ") who was always tearing things from the ground. Do you remember how, when tired of the long speeches at the peace conference : " His hand tightened on the olive-tree and a giant billow of effort went over his broad breast. A small stone jerked itself out of the ground at the foot of the tree as if it were a grasshopper jumping : and then the coiled roots of the olive-tree rose very slowly out of the earth like the limbs of a dragon lifting itself from sleep. ' I offer an olive-branch,' said Dalroy, ' more glorious than my sword. Also heavier.' "

What reminded me of him ? Well, I heard for the first time today that officialdom had ordered cancellation of the traditional free issue of beer to hospital residents. I heard, too, how the hospital management committees, anxious to do their best but having no licence, could not even *sell* beer to the boys. On the way home I thought about the good beer that we drank at dinner in the residents' mess long ago, and the better beer that sent us happy to bed filled with endless slabs of bread and cheese after the night round. And I found myself remembering how, when Lord Ivywood and his crazy Turk were threatening England with prohibition, Patrick Dalroy, hearing that men might drink wherever beer and an inn sign could still be found, remarked : " The best thing is to take the important things with us ! " And with two staggering kicks he sent the keg of rum and the round cheese flying over the fence. Then he gripped the pole of the inn sign, shook it twice, and plucked it out of the ground like a tuft of grass.

So started the immortal pilgrimage of the Flying Inn which saved England from the black teetotaller and left us a legacy of splendid Chestertonian songs.

I could raise a barrel of beer and at a pinch an inn sign ; but in these days, even through the blackest of black markets, I have my doubts about the great round cheese. Do you suppose that, if politely asked, the Regional Board would grant me a month's compassionate leave to set up my sign and barrel outside the residents' quarters in hospitals up and down what was once this free country ? And do you suppose that such a gesture would shame the Minister into giving the boys back their beer ?

* * *

Viva examinations do not always hold the terrors with which your correspondents are wont to invest them. Recently visiting one of these gatherings, I gained the impression that I had burst in on a whist-drive (progressive variety) organised by a local branch of the Mothers' Union. It turned out to be a blue-letter day, for just before my entrance a message was received from Broadcasting House that the Conservative Party were at last in the lead. Indeed during the inquisition (or rather tête-à-tête) we were continually having delivered to us small slips of paper, with the latest "state of the parties," by gentlemen whom I took to be bookmakers' runners specially employed for the occasion.

Partly for this reason, perhaps, the proceedings were genial. As we pored over specimens together, inspecting them from all angles—indeed I took one of them "over to the light," for all the world like a customer matching materials—an outside observer might have taken us all for knowledgeable collectors rejoicing in our latest find. When the bell rang harshly and abruptly and it was time to go, I reflected that the method of departure is the most unwelcome feature of these occasions. How much NICER it would be, if one were quietly approached by a dignified attendant who plucked one's sleeve and said, in a soft voice "Excuse me, Doctor, but it's time for you to leave"; whereupon one would look at one's watch, express one's apologies, and declare how much one had enjoyed oneself, but one really had to go.

Certainly there should be some opportunity—other than a contribution like this to In England Now—for expressing one's thanks to two examiners whose opening (none could be better calculated to put the candidate at his ease) is to smile warmly, place their tongues in their cheeks, and inquire as to their victim's nervousness.

* * *

In spite of all the wonderful victories of conservative dentistry, I maintain my allegiance to false teeth. Those I have are now very intimate friends of many years' standing.

Of course, like other friends, they have their limitations. They don't, for instance, like me too well when, on a country walk, I try to assimilate a stolen turnip, fresh and lovely and of the earth earthy; and I have to be careful not to challenge their feeling of security by coughing too violently. But otherwise our companionship is a happy one; so happy, indeed, that when brushing them I can sing or whistle—and that's more than my critics can do with their own more or less natural outfits.

* * *

We are short-handed at our little hospital, and in consequence most of us are required to undertake obligations that reveal unsuspected knowledge and efficiency, and to perform duties to which, it must be admitted, the official blind eye is not infrequently directed. The head porter, an ex-Naval man, has not so far been called upon to administer an anæsthetic, although I am sure he would not be found wanting in such an emergency; but the young lady dispenser is quite good at routine pathology, and I have an idea that massage is surreptitiously performed by the engineer, who claims to have taken a correspondence course of instruction.

Last week I was passing the X-ray department when they were investigating the whereabouts of a shilling swallowed by a small child. Assistance was required to ensure the patient's immobility; and detailed for this duty was—believe it or not—the Finance Officer.

* * *

His duodenal ulcer was successfully treated but he developed a headache instead. It was like a band round his head. He had seen a psychiatrist before and did not think much of them. Quite casually he told me that he was clairvoyant, his father was a medium, and his mother was telepathic. He also suggested that he might give me a "reading," which I gratefully accepted. When I asked what was his own view of his headaches he told me that a spiritualist friend of his had looked deeply into the affair and had come to the conclusion —here he smiled shyly—that a halo was growing round his head.

Letters to the Editor

WHY DOES PHLEBOTHROMBOSIS OCCUR?

SIR,—In 1934 Homans[1] described 4 cases in which there was clinical evidence of what he called "bland" or "quiet" thrombosis in the calf. Of these 4 patients 2 died from pulmonary embolism, and necropsy revealed extensive thrombosis of the veins of the calf muscles and in the popliteal vein, at which point, in both cases, the embolus had broken off. In one of the cadavers the great muscles of the thigh were similarly involved.

Phlebothrombosis is commonest in the older age-groups, and is very rare in childhood and adolescence. The sexes are equally affected.[2]

The occasional catastrophe which follows an otherwise successful operation or delivery has tended to focus attention on postoperative and postpartum cases, but it is now apparent that thrombo-embolic disease is by no means rare in the medical wards.[3] Fatal pulmonary embolism is much less common after childbirth than after operation, and non-fatal thrombosis slightly less common; but it should be remembered that maternity patients belong to the younger age-groups in whom the tendency to thrombosis is much slighter. It seems probable that thrombosis is *relatively* common in childbed.

The risk of postoperative thrombosis is closely related to the magnitude of the operative procedure,[4] but the low incidence after thyroidectomy is a striking exception to this general rule. Sudden death can claim the postoperative patient at any time, but the danger is greatest during the second week of convalescence.

The association between malignant disease and venous thrombosis has been apparent for many years, and forms the basis of "Trousseau's sign." Systemic infection is also regarded as a predisposing factor, but it seems certain that no actual infection of the vein wall occurs in the majority of the lower-limb thromboses.[5]

Overwhelming evidence points to the fact that deep venous thrombosis is common in the lower limb but rare in the upper limb, and that it is often associated with clots in the pulmonary vessels.[6] There is less unanimity regarding the sites of the primary thrombosis; these appear to be widespread but have been demonstrated most commonly in the area drained by the popliteal vein.[7 8] Most observers agree that the lower limb is the parent from which the majority of pulmonary emboli spring off, but others[9] postulate a simultaneous thrombosis in leg and lung.

A hundred years ago Virchow stated that intravascular clotting depends on three conditions—alteration in the vessel wall, alteration in the blood-content, and alteration of the blood current. These postulates remain unchallenged today.

Alteration in the Vessel Wall.—The close association between advancing years and the incidence of venous thrombosis has a parallel in the allied condition of arterial thrombosis, and it seems probable that a similar mechanism is involved. Hardening of the veins is palpably as common as hardening of the arteries and might be worth equally detailed histological study.

Alteration in the Blood-content.—Several investigators have produced evidence in support of an increased coagulability of the blood in thrombosis-prone individuals,[9 10] and this increased coagulability has been attributed by different observers to a whole host of alterations in the chemical or physical make-up of the blood. There is, however, no general agreement that any one of the suggested deviations from the "normal" is a significant factor in phlebothrombosis.

1. Homans, J. *New Engl. J. Med.* 1934, **211**, 993.
2. Barker, N. W., Nygaard, K. K., Walters, W., Priestley, J. T. *Proc. Mayo Clin.* 1941, **16**, 1.
3. Burke, M. *Amer. J. med. Sci.* 1938, **196**, 796.
4. Barker, N. W., Nygaard, K. K., Walters, W., Priestley, J. T. *Proc. Mayo Clin.* 1940, **15**, 769.
5. Murray, T. *Surg. Gynec. Obstet.* 1947, **84**, 665.
6. Hampton, A. O., Castleman, B. *Amer. J. Roentgenol.* 1940, **43**, 305.
7. Hunter, W. C., Krygier, J. J., Kennedy, J. C., Sneeden, V. D. *Surgery*, 1945, **17**, 178.
8. Bauer, G. *J. Amer. med. Ass.* 1946, **131**, 196.
9. Cummine, H., Lyons, R. N. *Brit. J. Surg.* 1948, **35**, 337.
10. Bancroft, F. W. *Ann. Surg.* 1929, **90**, 161.

Alteration in the Blood Current.—It would appear that venous stasis is now regarded as the prime cause of the condition, and Allen [11] emphasised that "stasis in the leg veins, dependent on bed rest and muscular inactivity, is in fact the chief underlying basic principle in the establishment of thrombosis." There is support for this belief in studies of circulation-time, using cyanide [12] and radioactive tracers.[13]

Little attempt has been made to explain *how* venous stasis initiates thrombosis, but the most acceptable hypothesis is that the resultant anoxæmia causes epithelial degeneration, thus providing favourable conditions for platelet degeneration.

Although the proven venous stasis in the lower limbs offers a ready explanation of phlebothrombosis, there are a few weak links in the chain of evidence which may disconcert an impartial observer. Firstly, it was shown as long ago as 1877 that blood can remain liquid for days between ligatures in a segment of healthy undamaged vein.[14] Secondly, thrombosis is far more common in the swift arterial current than in the leisurely venous stream. Thirdly, it is known that the peripheral elements of a moving column of blood are normally sluggish, and that gross stasis obtains in the capillary bed as a matter of physiological convenience.[15] Thrombosis is thought to occur primarily in the muscle veins of the leg, but a far greater degree of stasis exists in, say, the capillaries of the lip, where we look first to observe the visible effects of anoxæmia. The conflicting and inconclusive results which have followed the institution of "early ambulation" have not helped to resolve these doubts.[16–19]

It may be that some other factor plays a part; and this factor must operate maximally in the month which follows confinement to bed from any cause, it must exert its greatest effect on the lower limbs of the middle-aged and elderly, and it must be related to the gravity of the circumstance which prostrates the patient. If it is assumed that the association with advancing years can be explained by the progression of degenerative changes in the vessel wall, it only remains to equate this unknown factor with the early weeks of recumbency, with the vulnerability of the lower limb, and with the severity of the impact on the patient's constitution. All available evidence suggests that deep venous thrombosis in the leg is a result, not of prolonged recumbency, but of the abrupt translation from activity to the sick bed.

I submit that one factor—loss of flesh—is common to all thrombosis-prone individuals. Major operation, fever, marantic disease, childbirth—all, singly or in combination, are associated with rapid loss of weight. Much of the reduction is due to breakdown of muscle protein, and one can safely assume that the muscle veins are loaded with the products of protein katabolism.

Cuthbertson,[20] in his work on the metabolic response of the body to injury and disease, reports some striking confirmation of this assumption. He found that a marked loss of body-nitrogen occurs in the urine of patients who have undergone moderate or severe trauma; for example, in one fracture case 137 g. of nitrogen, equivalent to 4·38 kg. (9·6 lb.) of muscle were lost in the course of ten days. In general, although the response varies, the loss is proportional to the severity of the trauma; and Cuthbertson concludes that the process is "due to the organism catabolising its reserves to meet the exigencies of repair and maintenance." He goes on to say that "*it begins within a day or so following the injury, to reach a maximum within ten days and then slowly to decline.*" In the healthy subject recumbency produces a similar, but less marked, increase in the urinary nitrogenous excretion.

The introduction of intravenous feeding with protein hydrolysates has made clinicians familiar with the possible local effects of such an infusion of amino-acids into the veins, and it is not uncommon for this form of therapy to be curtailed on account of extensive thrombosis. Possibly, therefore, a raised concentration of the products of tissue breakdown might initiate thrombosis in the relatively unhealthy veins which drain the muscles of a middle-aged or elderly subject. Furthermore, it is reasonable to suppose that the risk of this untoward event would increase with the extent of the process, and the vulnerability of the lower, as compared with the upper, limb might be explained by the much greater mass of muscle involved. The weight of individual muscles has been calculated by Dursy, Theile, Weber, and others; and their figures, quoted by Vierordt,[21] show that the muscle-mass of the lower extremities is at least twice that of the upper extremities and constitutes 56% or more of the total musculature of the body. A relatively high incidence of thrombosis among puerperal women might be explained by the presence of the involuting uterus; and, conversely, the strikingly low thrombosis-rate after thyroidectomy may well be related to the fact that in thyrotoxicosis the operation tends to *reverse* a process characterised by loss of flesh.

It has to be admitted that some veins of the portal system have been conditioned to transport high concentrations of protein katabolites, but it is interesting to note that the superior mesenteric vein and its tributaries are the only veins in the body, other than those of the lower limb, in which "phlebothrombosis" constitutes a clinical entity. Mesenteric thrombosis is far less common than its counterpart in the leg, but some 800 cases have been reported.

Mesenteric occlusion, which usually presents as an abdominal catastrophe in an ambulant patient, is due to venous thrombosis in at least 75% of cases.[22] The site of the thrombosis is almost invariably in the superior mesenteric vein or its tributaries. In a review of 103 collected cases, Brown [23] records the following distribution of naked-eye changes in the gut:

Site	*No. of cases*
Ileum only	44
Jejunum only	7
Ileum and jejunum (in part or whole)	20
Small bowel (unspecified)	22
Lower ileum and cæcum	5
Colon	5

Three types of case are seen: (*a*) a frankly septic pylephlebitis secondary to some infective focus, usually the appendix; (*b*) a group with associated portal obstruction; and (*c*) the largest group, in which there is no apparent cause for the thrombosis.

It will be seen that the condition affects the veins which drain the *abosrptive* region of the gut, and that the stomach, the colon, and the rectum are for all practical purposes immune. The age-incidence of mesenteric thrombosis is very similar to that of phlebothrombosis in the lower limb, and the highest incidence is in the fifth decade.

Thus, in summary, phlebothrombosis is found in two situations—the deep veins of the lower limb and the superior mesenteric vein and/or its tributaries. A factor common to the affected veins is their relatively high content of the products of food or tissue breakdown; of these the protein element, from clinical analogy, seems to be the most important. The incidence is closely

11. Allen, A. W. *Surg. Gynec. Obstet.* 1947, **84**, 519.
12. Smith, L. A., Allen, E. V. *Proc. Mayo Clin.* 1941, **16**, 53.
13. Wright, H. P., Osborn, S. B., Edmonds, D. G. *Lancet*, 1951, **i**, 22.
14. Baumgarten, P. (1877). Quoted by Copley, A. L., Stefko, P. L. *Surg. Gynec. Obstet.* 1947, **84**, 451.
15. Best, C. H., Taylor, N. B. Physiological Basis of Medical Practice. London, 1950.
16. Canavarro, K. *Ann. Surg.* 1946, **124**, 180.
17. Powers, J. H. *Amer. J. Med.* 1947, **3**, 224.
18. Blodgett, J. B., Beattie, E. J. *Surg. Gynec. Obstet.* 1946, **82**, 485.
19. Cleland, G. J. *Brit. med. J.* 1948, **i**, 755.
20. Cuthbertson, D. P. *Brit. J. Surg.* 1936, **23**, 505.
21. Vierordt, H. Anatomische Physiologische und Physilalische Daten und Tabellen. 1906.
22. Moore, T. *Brit. J. Surg.* 1941, **28**, 347.
23. Brown, M. J. *Amer. J. Surg.* 1940, **49**, 242.

related to advancing years, and thus to progressive vascular degeneration. Venous stasis will tend to raise the intravenous concentration of protein hydrolysates by hindering the process of dilution.

I wish to thank Prof. R. D. Lockhart for providing me with the relevant reports on the weights of individual muscles.

Barnet General Hospital, Hertfordshire. V. J. DOWNIE.

THE POWER OF WORDS

SIR,—I read with great enjoyment, in your issue of Dec. 1, Lady Violet Bonham Carter's lecture to the Royal College of Physicians. May I add to her anthology of quotations and mention one or two notable omissions, no doubt imposed by time?

A. New Testament, *James* 2, chap. 3:

"(2) For in many things we offend all. If any man offend not in word, the same is a perfect man, and able also to bridle the whole body. (3) Behold, we put bits in the horses' mouths, that they may obey us; and we turn about their whole body. (4) Behold also the ships, which though they be so great, and are driven of fierce winds, yet are they turned about with a very small helm, whithersoever the governor listeth. (5) Even so the tongue is a little member and boasteth great things. Behold, how great a matter a little fire, kindleth! (6) And the tongue is a fire, a world of iniquity; so is the tongue among our members, that it defileth the whole body and setteth on fire the course of nature; and it is set on fire of hell. (7) For every kind of beasts, and of birds, and of serpents, and of things in the sea, is tamed, and hath been tamed of mankind. (8) But the tongue can no man tame; it is an unruly evil, full of deadly poison."

Even this formidable description might be called an understatement of the power of words.

B. No mention of Oscar Wilde, surely the greatest conversationalist of the last century. Yet he died in poverty, not solely because of his biological weakness, but because, as Shaw said, "He could not pass the hat round after dinner," though his entranced audience doubtless would have contributed gladly.

C. No mention of "jargon," as described by Sir Arthur Quiller-Couch in *The Art of Writing*. But in Ministerial circles, "Q" does not seem to be read. And the late George Orwell, writing on a similar subject in *Horizon*, held the view, and I think rightly, that, as our words and speech become more ponderous and slovenly so our actions and moral values deteriorate to the point of evil.

D. Lastly, the unspoken word, as powerful as that spoken, and I quote no less an authority than Miss Marghanita Laski. The insidious paragraph slipped in at the end of a memorandum, with its implications more sinister than the memorandum itself, the refusal to answer a question in the House of Commons, the Englishman's genius for understatement—these may cause a repercussion later though there may be no noticeable reaction at the time.

But all this no doubt Lady Violet knows, and I do not presume to criticise her beautiful address but merely to add a little.

Norwich, Norfolk. H. A. BRITTAIN.

LONGER LIFE

SIR,—The money-saving scheme proposed by Dr. Crofts in your issue of Nov. 10 is superficially sound. Simply reduce the weight of all obese persons and the death-rate must fall. In other words, if we make the fat people look like the thin ones then they will live equally long.

Dr. Crofts is assuming—quite unreasonably—that if their weights are reduced then they will no longer be prone to the diseases they would have developed had they remained fat. Until there is proof to the contrary I feel that we must believe that the obesity and the disease-proneness are due to a common cause—namely, body build and genetic make-up—and that the relief of obesity will not prevent the onset of disease but only its aggravation.

Johannesburg. R. W. MORRIS.

CHRONIC ALCOHOLISM

SIR,—The article by Dr. Moore and Dr. Drury (Dec. 8, p. 1059) on the use of 'Antabus' is welcome and valuable. I heartily endorse their statements and conclusions, but I should like to mention my experience with a patient for whom it seems to have an unusual degree of toxicity.

Antabus, in this case, had originally been prescribed elsewhere, but relapse had occurred because even half a tablet daily caused a persistent lassitude and lack of feeling of well-being which the patient, although coöperative, described as intolerable. Correspondence with Dr. Martensen-Larsen elicited his experience of keeping such a patient stabilised on one half-tablet twice weekly; but the infrequency of this dose provided for my patient too many loopholes for lapse of memory, and it quickly became obvious that a very small daily dose must be achieved.

After some experimenting and with the ready coöperation of the makers (Messrs. Gedeon-Richter), a tablet of gr. $1^1/_4$ (0·08 g.) was provided, and was found, on test, to be fully adequate. This dose (i.e., a sixth of the normal tablet) given at night instead of in the morning, is well tolerated, and over a period of seven months it has proved effective.

The wide range of dosage of the drug is interesting. Some patients, in contrast to the above, require two or even three daily tablets to produce a sufficient protective reaction, and I have not known them complain of the toxic side-effects.

Lympstone, Devon. E. JOYCE PARTRIDGE.

SELECTION OF MEDICAL STUDENTS

SIR,—Dr. Brinton's lecture, printed in your issue of Dec. 8, gives an impression of groping failure and confirms what many of us have long suspected—that the selection of medical students has been a very amateurish affair. I deplore even some of Dr. Brinton's primary rejects, which for an obscure reason he calls "negative personalities":

"*The youngster who continues to wage an adolescent rebellion . . .*"

An adult who takes to rebellion is never any good as a rebel; all the best rebels have started very young. Dr. Brinton has been throwing away what would have been the salt of the profession in the next forty years.

"*The arrogant cocksure chap . . .*"

These youths were probably reacting against a humiliated childhood and the strength of their reaction, like a leucocytosis, was the measure of their vitality. I am certain that Winston Churchill, as a young man, would have been one of the early babes whom Dr. Brinton has been jettisoning with the early bath water.

The personal interview, especially when conducted by the dean alone, suffers from the defect that it is liable to perpetuate in inordinate numbers the dean's type; the examiner is looking for the mirror of his own youth and ideals in the candidate. Like garlic, a pinch of some strong personalities goes a long way; one can easily have too many of them.

It is with especial horror that I learn from this lecture that two research inquiries are proceeding into this matter—one, by the Medical Research Council, at the psychological laboratory at Cambridge, and the other at the Institute of Psychiatry in London. I do not know what sort of medical paragon these bodies plan to produce, but I certainly do not like the psychologists' ideal man as so often given us. He seems to me to be so well balanced as to be a permanent fence-sitter, so little aggressive as to suggest a congenital absence of entrail, so omniscient as to remind one of the confidence-trick man. What do these bodies know of general practice, for which the majority of medical students are destined? I do not mean the sort of knowledge displayed in the lamentable Collings report—one gleaned by a few dozen sittings-in or goings-round. I mean a knowledge formed by the drudgery of years which yet are engrossing because on analysis they are found to consist of a series of problems and crises, threatened, impending or instant, by a working life spent in trying to follow the footsteps of

science in the slippers of accommodation, by long hours in surgeries where the essential complaints of a multitude must be elicited by half a dozen shrewd questions and countered with nostrums of known worth—a knowledge which enables its owner to assume the schoolmaster's gown in dealing with the lethargic or greedy, a priestly cassock with those who are in mind afflicted, or a fatherly or brotherly sympathy with those who are in deep shadow, a knowledge which has evolved the thousand artistries of general practice and its long, long thoughts.

I have worked for some two hundred general practitioners and have never known two who were not unlike in many ways—thank heavens. I submit that in the present state of psychological theory the only fair way of selecting medical students is, having first insisted on some minimum of bodily and mental efficiency and a record of more than average energy, that the names should be drawn from a well-shaken hat. Thus and no otherwise shall we get that diversity of types which after natural selection and the processing of time have well served a diversity of patients.

Beckley, Rye, Sussex. C. G. LEAROYD.

ALUMINIUM FOIL ON OPERATION WOUNDS

SIR,—Captain Southwood remarks in his article of Nov. 24 that he found no record of the use of aluminium foil on sutured wounds. I recommended the use of aluminium foil for dressings a quarter of a century ago[1] and have since been well satisfied with it. Aluminium foil can also be used for many other surgical purposes.

Budapest, Hungary. ENDRE MAKAI.

CORTISONE AND THE PATIENT

SIR,—I have had rheumatoid arthritis since I was sixteen, when it appeared as an infection with a great deal of swelling and contraction in both knees, and loss of strength in hands and feet. It was not at that time diagnosed as rheumatoid arthritis; but after 8 months of bed rest with sun treatment in Switzerland I appeared to get rid of the infection, and there were practically no noticeable after-effects in joints or movement. During the next 10 years, however, very gradual crippling of the hands developed and then pain and restriction of shoulders and elbows. This process was accelerated by a flare-up in 1941, when I was thirty. I was then working in New York and was given a course of gold treatment. This had, I think, some results, but they were not very dramatic.

A few months ago I had a full course of A.C.T.H. and cortisone in a New York hospital and am now on a maintaining dose of 'Cortone' tablets taken by mouth. The dose is gradually being decreased. The effect of the cortisone has, in my case, been quite dramatic. I am now almost free from pain; I have a great deal more strength in both hands and legs; and even limbs which have been contracted for as much as 10 years have been very largely released.

Though the arthritis had never made me unable to work or to get about I had been considerably disabled during the last 10 years. Stairs were difficult and had to be taken one at a time, one foot always first; a low chair or the seat of a car was very difficult to get up from; dressing, and particularly doing my hair, were slow and laborious. I couldn't reach up to a high shelf, and I couldn't get up off the ground, or out of a bath, without some help. Anything like pouring from teapots or jugs had to be done with both hands. When I got out of bed in the morning, or changed from any position in which I had been for some time—after sitting in a theatre seat, for instance—I had to move slowly and carefully, uncurling as it were. I walked slowly and with considerable limp—or roll. Aspirin (40 gr. a day, taken with bicarbonate) kept me fairly free of pain.

The first effect which I noticed after starting on treatment with cortisone was a sort of velvety sensation in my hands, and then in other joints. By the third or fourth day after treatment started, the increased strength and mobility of my hands was evident in such things as squeezing out a sponge or handling objects. I would never have known that it had always hurt a little to file my nails; but the new lack of pain, as I pressed on or turned the fingers, showed me that it must have done. Within a day or two I was getting out of bed in the morning in one movement, and starting to go at once without hesitation; and at about this stage I was started on a course of massage, physiotherapy, and whirlpool baths.

This has seemed to me to have been a very important part of the treatment. Though I had tried massage and exercises before, they had never produced much result; joints remained fixed and exercises were limited by pain and muscle weakness. Now, pain was less and it was possible to go at the exercises fairly roughly. It soon became clear that joints were freeing, though there were serious contractions of muscles and tendons, and even of skin, to be contended with. I do not myself believe that I would ever have profited fully from cortisone if the physiotherapist had not been working simultaneously on the stretching and on the strengthening of muscles.

I can now go upstairs fairly normally, and downstairs one foot after the other, though still a little bumpily; I walk far more briskly and almost without limp. Where I could only walk about half a mile with any comfort I can now do a mile and a half quite easily. The contracted joints are all released to some degree and some of them almost completely. My pain is so much less that I have given up the aspirin entirely. I am told that my blood-sedimentation rate, which had been very high for years, fell quite dramatically early in treatment. During the first few weeks, when I was on high doses of cortisone, I used to feel a little drugged and slightly swimming in the afternoons, but otherwise I have noticed no unpleasant side-effects at all from the treatment. I can still not get up from the floor, but believe that this is now largely a question of muscle, and that, with exercises and practice I may eventually hope to do so.

It has been curiously hard to notice and measure improvements. I find one does new things, or does things in a new way, quite unconsciously. Often it is not until someone else points them out that I notice the changed methods. Most of the time I was not very conscious of the disabilities: now I am not very conscious of their disappearance.

A PATIENT.

MORPHINE AND CORONARY OCCLUSION

SIR,—Dr. G. L. Davies's letter of Nov. 24 invites a reply from one who, in more than half a century's practice, saw some thousands of cases of heart-disease treated periodically or occasionally with morphine. It would, I think, be very sad for a great many patients if we refused them the morphine injection which gives so much relief from cardiac pain. I am fully aware that, very occasionally, patients have died after very small doses of morphine (0·0005 g. in Lewin's case). But is it certain that in such cases the heart-arrest was caused only by the toxic effect of the drug? I myself have had such cases; but when a necropsy was performed my assistants and I always found it astonishing that the patient had lived so long with his heart so badly damaged. Moreover, without going into details, I should recall that there is a peculiar form of "sudden death" in cases of heart-disease—i.e., Hering's *Sekunden-Herztod* (heart-arrest) which is caused most probably by ventricular fibrillation without significant anatomical findings.

I was ever convinced, and I am yet, that without a necropsy many of our mostly brilliant diagnoses of heart-disease are sheer rope-dancing.

Budapest, Hungary. LAJOS LÉVY.

1. Makai, E. *Zbl. Chir.* 1926, no. 29.

DANGER FROM DUCKS' EGGS

SIR,—The case described by your correspondent on Dec. 1 was also mentioned in the *British Medical Journal* on Dec. 8, and both accounts conclude that duck eggs were the source of the fatal infection by *Salmonella typhimurium*. After the incident a question on the dangers of duck eggs was asked in Parliament.

However, although every detail is given of the unfortunate patient's illness, no evidence is offered to show that the duck eggs were in fact infected. There appears to have been no attempt to submit eggs from the same batch, or ducks from the suspected flock, to bacteriological examination. We are given no reasons for excluding other food eaten before the onset of illness from consideration as causes of infection. Sources of *S. typhimurium* do exist other than duck eggs; and surely some evidence should be offered to enable the duck to have a fair trial before being incriminated?

Dartford. J. H. HUDSON
Medical Officer of Health.

CARDIOPNEUMOPEXY

SIR,—The use of the lung as a vascularising agent in experimental cardiac ischæmia is well known, but little has been written on its use in human angina. Lezuis [1] carried out experiments in the dog and his beneficial results from cardiopneumopexy in artificially produced ischæmia were confirmed by Carter et al.[2] and Reimann et al.[3] Carter [4] mentions one human case presumably using the same method as in the experimental animal. Mason [5] describes a case of cardiopneumopexy in which he used an irritant to produce adhesions; but all the stress is on cardiomentopexy based on the monumental work of O'Shaughnessy.[6]

For a long time it has seemed to me that the use of the lung offered an easier method of vascularisation, and early this year I performed the operation of cardiopneumopexy on two patients. The results seem to justify its extended use in selected cases of cardiac ischæmia.

CASE 1.—A man, aged 57, complained of a choking feeling in the neck and typical anginal pain, recently coming on after walking 10 yards. He also had attacks at night. Rest in bed and drugs had given little relief. Work was quite impossible and it was felt he could not be worse. Clinical examination showed a heart only slightly enlarged, but he had chronic bronchitis.

On Jan. 10, 1951, cardiopneumopexy was performed. Convalescence was easy and improvement rapid with increased exercise tolerance. An attack of bronchitis caused a setback, but by July he had returned to work. In November he was doing a full day's work, leaving home at 6.30 A.M. and not returning until 7 P.M. This was clearly too much for him, since he needed antispasmodic drugs to keep going. At weekends, however, he felt well and seldom required drugs. He is not completely cured, but there is a definite improvement; before operation he could not work at all and had pain even at nights.

CASE 2.—A man, aged 53, complained of typical anginal pain, which came on after walking 10–20 yards, and intense throbbing in the head. Recently he had had attacks in bed at night and he could not dress himself without precipitating an attack. Clinically the heart was not enlarged, but he showed signs of severe bronchitis. He looked a flabby, ill man. The outlook appeared hopeless, he was a bad operative risk, and rest and antispasmodic drugs did not even make life tolerable.

Cardiopneumopexy was performed on Feb. 14, 1951. Convalescence was a little more stormy and the chest needed aspiration on one occasion. The divided 3rd costal cartilage gave him some discomfort on deep breathing, but the throbbing in the head was relieved very early in convalescence. In May he had some anginal pain on exertion but felt much better, and if he did not hurry he could walk 200 yards without pain. In November his exercise tolerance remained the same and he needed antispasmodic drugs at times. He was not working but found life worth while, and he was particularly glad to be free from the throbbing in the head.

The operation was in each case comparatively easy, and I avoided the use of an irritant paste because it might have defeated its own object by producing excessive fibrous tissue. At operation the heart of the second man was markedly fatty, but ischæmic tissue was not obvious in either. I relied upon scarification and simple suturing to produce adhesions between the heart and the lung, but I feel that stripping the visceral pleura would increase the chance of good adhesion formation. I hope to try this in another case.

Not many patients require operation; but when life has become intolerable, as it had for these men, surgery is surely justified. I think the results show that cardiopneumopexy is more than an experimental method and should be tried in further cases. I believe it is easier and safer than cardiomentopexy, in which there is a danger of strangulation.

Shenfield, Essex. W. D. PARK.

1. Lezuis, A. *Arch. klin. Chir.* 1937, **189**, 342.
2. Carter, B. N., Gall, E. A., et al. *Surgery*, 1949, **25**, 489.
3. Reimann, D. L., Cowley, R. A., Raby, W. T. *Bull. School M. Univ. Maryland*, 1950, **35**, 1.
4. Carter, B. N. *Ann. Surg.* 1948, **128**, 210.
5. Mason, G. A. *Lancet*, 1951, i, 359.
6. O'Shaughnessy, L. *Brit. J. Surg.* 1936, **23**, 665.

COXA VALGA ASSOCIATED WITH OSTEO-ARTHRITIS

SIR,—During the last thirty years I have come across a few rather unusual cases of osteo-arthritis; and I have been greatly interested by instances of osteo-arthritis of the hip associated with definite lengthening of the affected limb.

In an osteo-arthritic hip the affected leg usually shows an inch or more of apparent shortening, but of course this is merely due to tilting of the pelvis to enable more weight to be transferred to the healthy leg plus erosion of cartilage and mushrooming of the head of the femur.

In a few—fortunately very few—cases one finds definite lengthening of the arthritic limb. The radiograph shows the head of the femur engulfed in the acetabulum and considerable cartilage destruction, but very few osteophytes. The condition is most painful, but the movements are not markedly impaired. It would seem to be a form of coxa valga plus arthritis, but even then one would expect the tilting of the pelvis to avoid pain to counteract the coxa-valga lengthening.

In these cases the results of treatment even with lactic acid are most disappointing, and I would be interested to hear if any of your readers have come across similar cases, and have any suggestions as to the cause of the coxa valga.

London, W.1. VERNON HETHERINGTON.

DIURETIC EFFECT OF ISOTONIC SALINE SOLUTION

SIR,—The excellent article by Professor Borst and his colleagues (Dec. 1) illustrates the necessity for reviewing the comparatively simple questions of what happens to water and salt when ingested or infused in normal subjects. Until these problems are solved—and Professor Borst has drawn our attention to the many unexpected responses which have still to be explained—we cannot presume to understand the mechanism of disordered water and salt balance, notably in œdema.

The authors mention, however, the attractive hypothesis that the anomalous response to saline infusion *at night* may provide a clue to the riddle of cardiac asthma. A corollary with therapeutic importance is the difficulty and danger of transfusing patients with overloaded circulations. Last week I saw an anæmic and clinically dehydrated patient die with pulmonary œdema after being infused with 3 pints (1650 ml.) of saline *overnight*. It would be worth while assessing the value of reserving these notoriously dangerous infusions for the day-time.

London, N.W.11. FRANK RACKOW.

THE DOCTOR'S OATH

SIR,—Your issue of Dec. 8 contains an account of a discussion by the General Medical Council of the declaration adopted by the World Medical Association at Geneva. I wish to make the following comments.

It is utterly useless for qualifying medical practitioners to take any oath affirming respect for human life and pledging themselves not to use medical knowledge contrary to the laws of humanity, unless such an oath is interpreted literally.

In times of war, or other emergency in which creed or country are at stake, few doctors would interpret the oath literally. A literal interpretation excludes membership of Armed Forces, since it is the duty of the doctor in the forces to keep men fit to fight, and to kill if necessary. Once any latitude is allowed in the interpretation of the oath to respect human life, then its meaning will vary according to the weight given to other obligations. It may not be difficult to decide not to become medical officer to a gang of thieves or murderers, but when country or creed are at stake the opponent, and that for which he stands, are considered so evil that respect for human life is of secondary importance.

Withyham, Sussex. PETER DUPRÉ.

A COLLEGE OF GENERAL PRACTITIONERS?

SIR,—The general practice of medicine could at the present moment be standing on the threshold of an intellectual renaissance. For the last few years medico-political issues have kept below the surface a slow but steady evolution of ideas in the minds of thinking doctors in and out of general practice; and increasingly these ideas are coming out into the open for discussion, criticism, and consideration in the medical journals.

From Dr. Hunt and Dr. Rose has come a lead which, if resolutely followed, might enable many of these evolutionary developments to find concrete expression. General practice is not a specialty. It is the senior form of medical discipline, and has been carried on, well or badly, in many forms, for as many centuries as man has cared for the health of man. Only in recent history has it given birth to specialties within itself—medicine, surgery, obstetrics, and others.

By the very nature of their work in the corporate departments of the developing hospitals, the specialists have been able and encouraged to combine and pool their knowledge in the interest of their calling. They organised themselves, and the country must be for ever grateful that as a result of their actions the three great Royal Colleges were born.

By tradition the general practitioner worked alone; he lived with his patients and worked in his practice area as an independent unit of health care. No opportunity arose for the body of knowledge in the minds of those in general practice to become combined and coördinated; and general practice, the mother of the specialties, remained static while her children prospered and outgrew her. While the good work of the colleges went on, before and after their royal charters were granted to them, the work in general practice never ceased. Practitioners lived and died, each having learnt much and published little or nothing. The general practitioners handled, and they handle to this day, at least 75% of the country's illness, and they carry this burden alone.

Dr. Hunt and Dr. Rose have shown us how we may achieve the fulfilment of the next stage in the natural, and inevitable, evolution and development of general practice; for the establishment of a College of General Practitioners would be no more and no less than this. General practitioners must achieve their college as their right and just due. They owe it to the memory of countless generations of predecessors in their practices that they accept no compromise title which carries with it the implication of inferiority to a college. General practitioners have been in a position of inferiority vis-à-vis the specialists for years, and it is this that they seek to amend. Were such an alternative title to be accepted, future general practitioners would bear the handicap of a decision made on the grounds of the political expediency of the moment, and they would have good cause to reproach those who lacked the courage to stand firm. In British usage a college will always rank higher than any other academic body, and no lesser title can be acceptable for the senior discipline of the medical art.

The Royal Colleges have nothing to fear from general practice. Nothing in its successes or failures can dim the lustre of their achievements of the past and future; but they will be the first to admit that general practice is not a new development seeking to establish itself as a specialty beside them, but the oldest medical discipline of all, becoming articulate for the first time in its history. A renaissance of general medical practice could not but benefit medicine as a whole, and if every branch and division of medical thought gives of its best to add flesh and substance to the College of General Practitioners, that college will take its place worthily alongside all other organisations of men with the interest of their profession at heart.

Birmingham. R. J. F. H. PINSENT.

EVOLUTION OF THE TOXIC THYROID GLAND

SIR,—Mr. Levitt's attempt (Nov. 24, p. 957) to unify our concept of the various diseases of the thyroid gland into one of transition from epithelial hyperplasia through increasing lymphoid infiltration to Hashimoto's disease and final fibrosis is interesting but not completely convincing.

In 1948 Dr. Davson and I [1] studied a series of 121 patients in whom thyroidectomy had been performed and where the histological sections showed various stages of lymphocytic infiltration. The histological pictures grouped themselves conveniently into a continuous series, from typical thyrotoxicosis to lymphadenoid goitre, with intervening changes of increasing lymphoid infiltration, Huertle-cell changes, fibrosis, and increasing atrophy and disorganisation of the vesicles. Clinically this series presented a gradual over-all change from toxic goitre to non-toxic enlargement of the thyroid gland. But this was only to be expected if histological interpretation has any value. What our investigation did not prove, and Mr. Levitt has not proved either, is that these are changes through which the most advanced cases have previously passed and the less advanced cases may pass in future. No case of lymphadenoid goitre has ever been observed to change to Riedl's thyroiditis. McClintock and Wright [2] reported a case of recurrent lymphadenoid goitre where partial thyroidectomy was performed twice with an interval of 9 years. Histological sections showed no progression towards Riedl's disease.

From our cases it seemed to us more likely that both lymphocytic infiltration and epithelial proliferation are expressions of the functional state of the thyroid gland. What determines the difference in the behaviour of the gland in different patients is a matter for speculation. We tried to show that it may depend on the capacity of the gland to increase its blood-supply, either focally or throughout, in response to the functional demands of increased thyrotropic stimulation. If and where this fails, the relative ischæmia leads to lymphocytic infiltration instead of the epithelial changes of thyrotoxicosis. As failure to increase blood-supply is more likely to occur with increasing age, it may not be surprising that Mr. Levitt's series showed an increase in age with increasing lymphocytic infiltration.

Victoria Memorial Jewish Hospital, Manchester. H. M. GOLDBERG.

1. Goldberg, H. M., Davson, J. *Brit. J. Surg.* 1948, **36**, 41.
2. McClintock, J. C., Wright, A. W. *Ann. Surg.* 1937, **106**, 11.

Obituary

CHRISTOPHER ADDISON

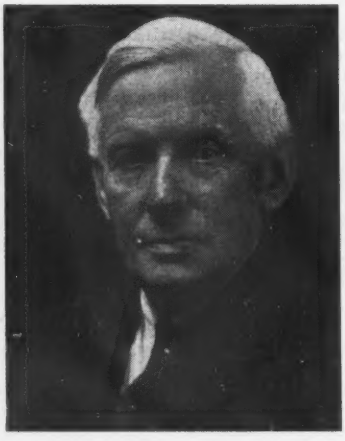
VISCOUNT ADDISON OF STALLINGBOROUGH

K.G., P.C., M.D. Lond., F.R.C.P., F.R.C.S.

Lord Addison, who died on Dec. 11, had lived a long and well-filled life. Between his appointment to a chair of anatomy, when he was 25, and his distinguished leadership of the House of Lords, which ended only a few months before his death, lay 57 years of varied and useful service on behalf of his profession and his fellow countrymen.

The son of a Lincolnshire farmer, Christopher Addison was born at Hogsthorpe in 1869. He was educated at Trinity College, Harrogate, and St. Bartholomew's Hospital, London, where he qualified in 1891. Soon afterwards he became demonstrator in anatomy at Barts, a post which he held till he was appointed to the chair of anatomy at Sheffield in 1894. In the following year he took his F.R.C.S.

During his seven years at Sheffield he did much for that young and growing school. "He came to a department," wrote a colleague of those early days, "which was below standard. He left behind him one that was in every way up to date and flourishing."



[Press Portrait

"One evening when I called to see him," the same colleague continues, "I found him surrounded with books, but none of them had to do with science in general or anatomy in particular. They were all either about history or political economy. His reply to my expression of surprise was: 'Politics is my game, not medicine.' At that time and in those surroundings, it seemed a far-off cry. Here was a young man, with no private means behind him and earning at that time only a meagre salary. How such a future was to be realised was difficult to imagine. However, he had three elements in his make-up which together can go anywhere: brains, determination, and a definite point at which he aimed. From the line which would lead to this he never swerved, every step was chosen to help him along it. It was obvious that a man could not hold a seat in Parliament whilst occupying a chair in the provinces; the first step, therefore, was to get a similar post in London. For this some original work must be done on his subject in order to bring his name as an anatomist before the London medical teachers. For such work the material in our comparatively small anatomical centre was insufficient. Nothing daunted by this he laid his plans. Just about this time, with the advance of Listerism, the abdomen was becoming each year the site of more and more elaborate operations and the exact relative positions of the different viscera more important to know. Such knowledge of this kind as was to be found in the textbooks of the day was quite insufficient for the modern surgeon. Here Addison found his opportunity. It meant careful systematic measurements and recording of the position of the abdominal viscera in a large number of normal subjects. To obtain material, he got in touch with friends on the staffs of mental hospitals, where in those days routine autopsies were made on all patients who died, as part of the regulations. As the interest of the psychiatrists was in the cranial rather than the abdominal contents, there was no difficulty in allowing Addison to carry out all his measurements before the autopsy was started. He spent his vacations on this work, for which he was awarded a Hunterian professorship in 1901. I believe that even today one of the landmarks which he first described, the trans-pyloric plane, is still known as Addison's line and is a valuable aid to the operating surgeon."

In 1901 Addison accordingly returned to London to become lecturer in anatomy at Charing Cross and later at Barts, and the years that followed were those in which he was most active in the medical profession. Medical education was one of his first interests, and he was not only dean of the school at Charing Cross for several years but also chairman of the Board of Intermediate Medical Studies of the University of London, and a member of the Board of Human Anatomy and Morphology. He examined for the Universities of Cambridge and London and for the Royal College of Surgeons; he was secretary of the Anatomical Society, and editor of the *Quarterly Medical Journal*. Meanwhile further contributions to his specialty appeared in the proceedings of the Royal Society and in the *Journal of Anatomy and Physiology*.

In 1910 he entered Parliament as a Liberal and quickly won political recognition and promotion. In the difficulties which arose between Mr. Lloyd George and the doctors during the protracted negotiations on the National Insurance Acts Dr. Addison was of great help, and his qualities of industry, fairness, and flexibility were recognised by both sides. During the 1914–18 war he continued to act as Lloyd George's able lieutenant, later becoming, in his own right, Minister of Munitions and Minister in charge of Reconstruction.

When the Ministry of Health was created in 1919 Addison was the obvious choice as the first Minister. Like the National Health Service in our own day, the new venture was called upon to undertake difficult tasks in difficult times, and though the new appointment in the end proved to be a setback to Addison's political career, it was largely due to his wise guidance that so much of the work of the Ministry was lifted for ever out of politics. His own work at the Ministry was dominated by his belief in preventive medicine, and as an experienced educationist he recognised the importance of educating the public and the medical profession. The series of valuable memoranda on public-health subjects was among the first projects of the new Ministry.

From his time as Minister of Munitions he had learnt that research was a valuable and economical ally to preventive medicine, but he was content that the new Medical Research Council, which was shortly to replace the Medical Research Committee, should remain under the ægis of the Privy Council. In a memorable white-paper addressed to his colleagues in the Cabinet he urged the necessity for placing a research organisation in a position of scientific independence.

The most important need of preventive medicine, as Addison saw it, was better housing; but his treatment of this problem was not generally acceptable, for the scheme of subsidies which he set up was held to be both expensive and unsuccessful, and he was forced to retire to the back-benches. He lost his seat in the general election of 1922, and later he joined the Labour Party. In the same year he published *The Betrayal of the Slums* in which he defended his housing policy.

In 1929 he returned to the House of Commons as a Labour member, and he became Minister of Agriculture in 1930 in the second MacDonald government. This work, too, was closely linked with his belief in preventive medicine, for he appreciated that people cannot be educated to eat the proper kind of food if it is beyond their purchasing-power. He held that a more rational system of marketing our agricultural products was an essential to public health, and in 1939 he summed up his ideas in *A Policy for British Agriculture*.

In 1937 he began yet another stage of his career, when he received a barony and entered the House of Lords. In 1945, when the Labour Party came into office, he was appointed Secretary of State for the Dominions and in the same year he was raised to a viscounty. Later he became Secretary of State for Commonwealth Relations. But it was as leader of the Upper House that he achieved the greatest success of his political life. He held this appointment during difficult years, but under his guidance constitutional and other problems were discussed in an atmosphere of tolerance and frankness. He was made a

Knight of the Garter in 1946, being the first doctor thus honoured in all the long history of the Order.

By a happy chance the offices which he held towards the end of his life once more linked him closely with his first profession and earlier colleagues. In 1948 he was appointed chairman of the Medical Research Council, and he returned with pleasure and interest to an organisation which he had done so much to form. For a few months this year as Lord President of the Council he became the Minister responsible to Parliament for the M.R.C. and its fellow research departments. The return of this distinguished medical wanderer was formally recognised by his colleagues, when, under a special by-law, he was this year elected to the fellowship of the Royal College of Physicians of London.

Of his work in the House of Lords L. H.-G. writes:

"Lord Addison's vigour of speech, his quickness of ripost in debate, and his quickness of movement when walking in the corridors of the House of Lords made it difficult to believe he was in his eighties. In private discussion he was equally quick, and, what is not always true of those who can make decisions quickly, equally persuasive—perhaps because he often had a twinkle in his eye and had a rich sense of humour.

"The House of Lords differs in some respects in its procedure from the House of Commons. It is more informal and it arrives at its conclusions more often by general agreement; and with Lord Addison as leader it was rare that we failed to reach agreement. A visitor indeed watching the proceedings might well have thought that Lord Addison was leader of the Conservatives and Liberals as well as the Labour benches. But there was no doubt about his own opinions, which he expressed with vigour and clarity.

"He held many offices and left his mark on many departments. Both as a doctor and as a political leader he made a great contribution to political thought and practice, and he leaves a record as one of the outstanding constructive political thinkers of this age."

Lord Addison married Miss Isobel Gray in 1902. She died in 1934, leaving him with two sons and two daughters. In 1937 he married Miss Dorothy Low, who survives him.

Appointments

CRAIG, C. M., M.B. Lond., F.R.C.S.: consultant surgeon, Lowestoft Hospital (Norfolk and Norwich Hospital group).

JAMES, P. ASHMAN, M.B. Brist., F.R.C.S.: registrar in general surgery, Gloucestershire Royal Hospital, Gloucester.

LAWSON, J. B., M.A., M.B. Camb., D.OBST.: registrar in obstetrics and gynæcology, Southmead Hospital, Bristol.

O'SHEA, TERESA, M.B. N.U.I.: asst. psychiatrist, Pen-y-Val Hospital, Abergavenny.

PILLAI, SUNDRAM, M.B. Rangoon, F.R.C.S., D.O.M.S., D.L.O.: ophthalmologist, mid-Glamorgan H.M.C. group.

Hospital for Sick Children, Great Ormond Street, London:

GOLDSMITH, H. J., M.B. Lond., M.R.C.P.: house-physician.

NORMAN, A. G., M.B. Camb.; house-surgeon.

OATWAY, A. W. N., M.A., M.B. Camb., M.R.C.P.: asst. medical registrar.

Appointed Factory Doctors:

ARMSTRONG, G. A., M.B. Lond.: Patterdale district, Westmorland.

CLEGG, W. B., M.R.C.S.: Bishop's Castle district, Salop.

FINDLATER, JOHN, M.B. Edin.: Carnforth district, Lancaster.

HOLLAND, C. K., M.B. Lpool: Hinckley district, Leicestershire.

SCOTT, HELEN, M.R.C.S.: Southend (Campbeltown) district, Argyllshire.

Births, Marriages, and Deaths

BIRTHS

CONWAY.—On Dec. 5, the wife of Dr. D. J. Conway, of London, S.W.1—a son.

DORAN.—On Dec. 10, in London, the wife of Dr. John C. Doran—a son.

GOLBERG.—On Dec. 7, in London, the wife of Dr. Boris Golberg—a son.

ORMEROD.—On Dec. 10, in London, the wife of Dr. Michael Ormerod—a son.

DEATHS

ADDISON.—On Dec. 11, at Radnage, near High Wycombe, Christopher, Viscount Addison, K.G., M.D. Lond., F.R.C.S., aged 82.

O'BRIEN.—On Dec. 8, at Crosby, Thomas Cyril Baron O'Brien, L.R.C.P.I., of London, aged 53.

VIEHOFF.—On Dec. 8, at Crosby, Liverpool, Herman Crowther Viehoff, M.R.C.S.

WILSON.—On Dec. 10, at Luddenden, Yorkshire, Alexander Garrick Wilson, M.B. Camb., F.R.C.S., of Beaminster, Dorset.

Notes and News

FOOD AND FADS

Dr. Charles Hill, M.P., chose this subject for the first Armstrong memorial lecture to the Royal Society of Arts on Dec. 12. The late E. F. Armstrong, F.R.S., whose work the lectures commemorate, made a particular study of food chemistry from his early years. He must often have wondered, Dr. Hill remarked, at the delusions about food and food values which are so prevalent today. Sugars had been of especial interest to him, which led Dr. Hill to consider some of the current and popular notions about sugar. Sugar and sweets are not the indispensable foods that many people think—energy foods certainly, but nothing more. They contribute only carbohydrate to the diet and tend to displace those foods which also supply protein, minerals, and vitamins. Dental caries is considered to be at least partly due to an excessive sugar consumption. War-time rationing reduced the incidence of dental caries in children.

It is very difficult to persuade the public that the high-extraction loaf which we eat today is a much better nutritive bargain than its whiter predecessor. Its appearance and palatability weigh against it, and Government measures to improve nutrition through the composition of bread have not always been welcomed. Plans for the provision of cheap milk were more popular, but there are still those who say that it is fattening and therefore refuse to drink it. The vigorous milk propaganda of recent years must take some responsibility for this; the distinction between "well-fed" and "fat" is a narrow one in the public mind. And yet in no other food, said Dr. Hill, do the essential constituents occur in such ideal proportions or in a form so readily assimilated.

Another failing attributes to certain foods wonderful properties which they do not possess. A particularly valuable source of some nutrient is discovered by "research"—often a process of skimming through tables of food values. The quantity of the food taken in a normal diet is ignored. Parsley, much quoted as a source of vitamin C, is very rarely eaten in any significant amount; when used to garnish a dish it is put aside uneaten and in sauce the vitamin is probably destroyed in preparation. The fallacy that spinach provides iron and energy in abundance takes its origin from the exploits of Popeye, the prodigious sailor of the cartoons, but there is no scientific reason why his remarkable feats should be due to this particular vegetable. It is now believed that the oxalic acid in spinach combines with the iron and prevents its absorption; and there is certainly very little energy value in it.

There are a great many dietary systems which claim to cure or prevent disease, and most of them, Dr. Hill remarked, have little scientific basis. Some people manage to live and keep fit on vegetables and fruit alone, but this diet has its dangers. It may be poor in protein, fat, and calcium, and may possibly be devoid of vitamin D. Its bulkiness hinders the digestive process and stimulates peristalsis, giving no time for proper absorption. Most vegetarians eat eggs, milk, and cheese as well and so avoid many of these difficulties. There is little to recommend the system which separates protein from carbohydrate—one at one meal, one at the next. Quite apart from the loss of such pleasures as bread-and-cheese and fish-and-chips, the idea is physiologically unsound. The protein is turned into energy and not tissue when there is no carbohydrate to spare it.

Dr. Hill talked entertainingly about a variety of other foods which have been praised for this virtue or that. Crude molasses, which even the manufacturers own is "burnt, black, and bitter," has been eulogised as a "wonder food." It has been recommended for arthritis, heart-disease, gall-stones, and numerous other ills. It appears that medical science has overlooked an extraordinarily potent substance.

BRITISH RAILWAYS MEDICAL SERVICE

British Railways are reorganising their medical service, to bring it more into line with the recommendations of the Dale Committee.

The service is in charge of the chief medical officer at the Railway Executive headquarters in London. Under him, there is a regional medical officer at each of the headquarters of the six railway regions, each of whom will be responsible to the chief regional officer for the day-to-day conduct of

the whole of the medical services and organisation within his region; for conducting routine and special medical examinations; and for hygiene, first-aid, and advice on welfare and on all other matters affecting the health of the staff. Each region will be divided into medical areas in charge of a full-time area medical officer responsible to the regional medical officer. The area medical officer will advise the district departmental officers and others on medical matters. Big railway workshops will each have a works medical officer. The new organisation will need additional doctors who will be trained for a year in the technique of railway medicine before taking up their appointments. Besides the railways staff the new organisation will also cover employees of the road haulage, docks and inland waterways, and hotels executives—730,000 in all.

DISABLEMENT AND OCCUPATION

DISABLED people generally impress those who know them with their capacity to make their own way in the world, given a reasonable chance. As Dame Georgiana Buller has put it,[1] bountiful Nature supplies us with a number of spare parts, and when one is lost or damaged another takes over, often very successfully. The difficulty of getting the reasonable chance, however, is often considerable, and has discouraged many a handicapped person. In *Disabled Citizens*[2] Joan Simeon Clarke describes the kinds of setback which the trained and competent disabled person repeatedly encounters. Those who find their disabilities scarcely more than an inconvenience often suffer most from the prejudice of others. The epileptic, and the patient with arrested tuberculosis, especially, often find great difficulty in getting work. Again, appearances may tell heavily against the disabled; a highly intelligent person with cerebral palsy may look, to a stranger, like a mental defective. These and other disabled people may be refused appropriate work because employers are pressed by their insurance companies not to employ the handicapped—whose proneness to accident is erroneously assumed to be above average. Actually, of course, cripples are good and careful judges of risk; they have to be.

Mrs. Clarke discusses the provisions now made for the care, education, and treatment of various categories of the disabled, including those with cerebral palsy, epilepsy, and tuberculosis, the deaf, handicapped children, and employable and dependent adults. She draws attention to the gaps in our services and proposes amendments and additions. Some of her proposals—for all that the foreword to her book is written by so careful an economist as Lord Beveridge—have the spacious generosity of the enthusiast planning a utopia. Others, however, are reasonable enough. Thus for cerebral-palsy cases she would very properly like to see new treatment centres, primarily for infants, planned on the lines of the unit at Queen Mary's Hospital, Carshalton; to these would be attached centres where older children could go for intensive treatment for relatively short periods; and she notes the need for more staff trained in this work. For epilepsy she advocates new diagnostic centres, on the lines of the Filadelfia Colony at Dianalund in Denmark, which is fully equipped for radiography, electro-encephalography, and the like, but is run less like a clinic than a country hotel. Failing this, she thinks, there might be itinerant clinics, such as they have in Switzerland, which undertake not only diagnosis and treatment, but also the social care of the patient. We should have said that the diagnosis of epilepsy was reasonably effective in this country already; and various social provisions have already been made. But we agree with Mrs. Clarke about the need for an educational campaign to relieve the public of some of their fear of this disease and to encourage them to accept calmly the sight of an epileptic attack. School teachers, in particular, need instruction, so that they themselves and the children they teach become allies in the social management of this disorder. Boarding-out of epileptics from colonies is widely practised in Denmark, and makes, Mrs. Clarke is sure, for the happiness of patients.

She urges the need for more sanatorium beds for the tuberculous but without reference to the vexed problem of staffing. Indeed she often pleads for more staff in various situations where experience shows they are very hard to come by. Thus she would like to see trained tuberculosis almoners appointed in all areas, and asks for more trained teachers of the deaf, more home teachers for the handicapped, and more visitors trained as social workers. She is equally lavish with equipment, proposing an extension of mass-radiography, electro-encephalographs in every epileptic colony, mobile orthopædic clinics, and more mobile physiotherapy services. To coördinate all the work done for the disabled she suggests that a body should be set up, backed by Government grants and voluntary funds, to keep a register of accommodation for the handicapped, publish a journal, and maintain an information bureau. Locally there should be a competent case-work service for families with a handicapped member.

This lively hopeful book is full of good ideas, and serves well to remind us of how much we still lack; but it pays too little attention to our present material difficulties.

1. See *Lancet*, Nov. 24, 1951, p. 978.
2. London: George Allen & Unwin. 1951. Pp. 237. 16s.

University of Dublin

On Dec. 6 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—T. T. Chapman, E. R. N. Cooke.
M.Ch.—J. E. F. Coolican.
M.A.O.—A. D. H. Browne.
M.B., B.Ch., B.A.O.—Neville Boland, Norma E. Boyd, Iris E. Byers, E. D. Cooke, D. L. Cowan, Patricia G. Ellis, Phyllis E. Featherstone, K. W. M. Harbord, Wilfred Jackson, Ethel G. Jennings, T. D. Kimmet, Robert King, G. J. Malseed, Edith P. Pringle, Aileen F. Smith, W. McC. Wilson, B. W. Withrington.

National University of Ireland

Dr. R. G. Barry has been appointed lecturer in pædiatrics and Dr. R. B. Dockrell lecturer in orthodontics.

Royal College of Physicians of Ireland

On Dec. 7 the following, having passed the final examination of the Conjoint Board of Ireland, were admitted licentiates in medicine and midwifery:

A. S. Beilin, Francis Coyne, Anita C. Doherty, J. E. Flanigan, R. F. Frost, N. L. G. Gough, Mary M. B. Hillery, B. J. P. Leahy, Maire M. P. Leahy, G. J. McManus, M. J. Murphy, Mary P. Murray, D. J. O'Kelly, Eugene O'Neill, Dermott O'Reilly, J. F. X. O'Sullivan, Katherine P. Prendiville, B. D. Quigley, Mary T. C. Rahill, M. J. Ryan, Michael Ryan, W. A. Ryan, J. P. Stewart, R. A. Wade.

Royal College of Surgeons of England

Faculty of Anæsthetists.—Lord Nuffield has given £11,000 to the faculty.

Association of Surgeons of Great Britain and Ireland

At the annual meeting of the association to be held in Cardiff on April 17, 18, and 19, Mr. E. W. Riches and Prof. Charles Wells will open a discussion on the Treatment of Retention of Urine Due to Enlarged Prostate, and Sir Stanford Cade, Mr. A. J. Gardham, and Dr. J. L. Dobbie on Carcinoma of the Floor of the Mouth.

Epsom College

Lord Webb-Johnson has been appointed president of Epsom College in succession to the late Viscount Leverhulme.

Royal Society

Prof. E. D. Adrian, O.M., has been re-elected president of the society. Other members of council include Prof. P. A. Buxton, Dr. I. de Burgh Daly, Prof. E. C. Dodds, Sir Howard Florey, and Sir Geoffrey Jefferson.

Royal Faculty of Physicians and Surgeons of Glasgow

At the biennial dinner of the faculty on Dec. 7, with Mr. Walter Galbraith, the president, in the chair, the principal guest was Mr. James Stuart, who replied to the toast of His Majesty's Ministers. A National Health Service, he said, was agreed by all parties to be desirable. As Secretary of State for Scotland he wished to be advised not only by politicians and Civil Servants, but also by the people who had to work the service; the doors of the Department of Health would always be open to the profession for discussion and advice. Prof. David Campbell, president of the General Medical Council, proposing the Sister Corporations, said that the Royal Corporations had become exclusive of the general practitioner and he doubted whether this was necessary or wise; it had given rise to the demand for a new college. He suggested that if the Scottish Royal Corporations wished to fulfil their function in Scotland they should consider union, with the setting up of a Scottish College or Academy of Medicine.

CORRIGENDUM: *Surgeons in Honolulu.*—We regret that in our annotation of Dec. 1 (p. 1028) we mis-spelt the name of Dr. Nils Larsen, who has been elected honorary president of the Pan-Pacific Surgical Association.

DEC. 29, 1951 PAGES 1189 TO 1232

THE LANCET

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INFLUENZA

A STUDY OF FOUR VIRUS STRAINS ISOLATED IN 1951

WILSON SMITH
M.D. Manc., F.R.S.

J. C. N. WESTWOOD* M.B. Camb.
G. BELYAVIN M.B. Lond.

From the Department of Bacteriology, University College Hospital Medical School, London

FROM an examination of over 70 virus-A strains isolated during the 1950–51 outbreaks of influenza Andrewes and Isaacs (1951) have described two types, which they have designated the Scandinavian and Liverpool types respectively. Both were widely distributed throughout the world and though one or other type was clearly dominant in most countries there were many localities in which they existed side by side. This was the case in the United Kingdom and Ireland. Antigenic analysis showed that all the strains fall into the A-prime group, being related to the F.M.1 strain but having relatively little in common with the influenza A types, PR8 and W.S., and no relationship with B-type virus. A major distinguishing characteristic is the fact that homologous convalescent ferret sera will inhibit hæmagglutination by Liverpool strains to a low titre only but to a normally high titre in the case of Scandinavian strains.

While this antigenic analysis has to some extent elucidated the geographical pattern of the epidemic spread of influenza during 1950–51, it has thrown no light on one of the most significant features. The disease throughout the world appears to have been uniformly mild, with the single exception of the Liverpool district in the North-West of England, where the death-rate from influenza reached the figure of 216 per week as compared with 230 in 1918–19. Nevertheless strains of virus isolated in Liverpool were antigenically indistinguishable from Liverpool-type strains derived from areas where the disease was uniformly mild. Unless, therefore, some unsuspected environmental feature determined the local course of the outbreak, the key to the Liverpool episode must lie in biological characteristics of the causative virus which are not reflected in its antigenic constitution.

The four strains of virus with which the present report is concerned were obtained from cases in London. The technique of examination did not include the use of ferret convalescent sera, and no attempt was made to type them in accordance with the classification of Andrewes and Isaacs; but a biological study has been made which may throw some indirect light on the kind of anomalous virus behaviour presented by the Liverpool episode.

MATERIALS AND METHODS

Standard Virus Strains

The standard reference viruses used in this investigation were influenza A, PR8; influenza A-prime, F.M.1; and influenza B, Lee. The PR8 and Lee strains have been maintained in this laboratory by allantoic passage since 1947, during which time they have received 51 and 20 consecutive passes respectively. The F.M.1 strain was obtained from the World Influenza Centre, Mill Hill, by the courtesy of Dr. C. H. Andrewes, in April, 1951, since when it has undergone 6 consecutive allantoic passes.

All virus preparations for use in experimental work were stored at 4°C and used either as pooled infected allantoic fluids or as suspensions partially purified by adsorption on, and elution from, human group-O red blood-cells.

Antisera

Specific antisera were prepared in rabbits by intravenous injection of infected allantoic fluids. With PR8 and Lee strains a single injection, of 800 and 350 hæmagglutinating doses (A.D.) respectively, elicited an adequate antibody response in fourteen days, but F.M.1 and the new strains were of low hæmagglutination titre and a secondary stimulus was required, serum being obtained five days after the second injection. A small amount of convalescent ferret serum against F.M.1, kindly supplied by Dr. Andrewes, was also used in the antigenic analysis.

Hæmagglutination Titrations

Hæmagglutination titrations were carried out by a modification of the photo-electric technique of Hirst and Pickels (Belyavin et al. 1951).

Complement-fixation

Complement-fixation tests were performed by a microtechnique based on that of Fulton and Dumbell (1949). Doubling dilutions of antigen were tested against doubling dilutions of antiserum with a fixed complement dosage, the resulting areas of fixation giving a numerical measure of the degree of antigenic crossing between strains. The technique of the test and the theoretical considerations of its use in antigenic analysis will be published shortly.

Receptor-destroying Enzyme (R.D.E.)

R.D.E. was prepared from cultures of *Vibrio choleræ* by the method of Burnet and Stone (1947) and was purified by adsorption and elution using human group-O cells. The same freeze-dried batch has been used throughout.

EXPERIMENTAL

Origin and Isolation of the New Strains

Strains M.W. and HAL were obtained on Jan. 9 and 14, 1951, from a medical student and a house-physician in University College Hospital; strain N.G. was obtained from a patient in Barnes on Jan. 14 and strain Iris from a member of our laboratory staff on Jan. 24. Thus the four strains were isolated over a period of a fortnight and three came from patients normally working in the hospital or medical school.

All the cases were clinically typical influenza, with chills, malaise, upper respiratory symptoms including unproductive cough, and a fever lasting about five days with a maximum temperature on the second or third day varying from 102·8° to 104°F. Case HAL had slight physical signs at the left base and radiography showed a few fluffy opacities which were attributed to aspiration pneumonia and cleared completely in a week. The other cases were uncomplicated. Throat washings in each case were taken at the peak of the fever on the second or third day.

All strains were isolated by amniotic inoculation of developing chick embryos at either the eighth or tenth day of incubation. Penicillin and streptomycin were added to the throat washings to give a final concentration of 2500 units of each per ml., and 0·2 ml. quantities were inoculated amniotically into each of 6 embryos. The eggs were incubated at 37°C and those with surviving embryos harvested on the third day. Subsequent passes were made with amniotic fluid.

Allantoic adaptation of the strains was initiated by inoculation of 0·2 ml. of infected amniotic fluid into the allantoic cavities of ten-day embryos and incubating for three days at 36°C. Strains HAL and N.G. adapted without difficulty and have been maintained by serial passage of allantoic fluids, but M.W. and Iris tended to die out on serial allantoic passage. In the case of M.W.,

*Seconded for virus research from the staff of the Public Health Laboratory Service.

TABLE I—VIRULENCE OF THE NEW STRAINS FOR CHICK EMBRYO

Virus strain	Primary inoculation	Serial amniotic passages										
		1	2	3	4	5	6	7	8	9	10	11
HAL	0/2	0/2	0/2 *	0/7	0/6	2/2 †	3/4	4/4	2/2	0/2	0/2	0/2
M.W.	0/4	0/6	0/4	0/5	4/7	2/7	4/5					
N.G.	0/5	0/4	0/5 *	0/6	3/4							
Iris	0/2	0/2	0/4 *	0/5	0/6							

Numerators show numbers of embryos killed, denominators the numbers of eggs inoculated.
* Deaths probably due to non-specific causes.
† 5th and subsequent passages of HAL made with chick brain suspensions.

supplies of infected allantoic fluid of sufficiently high titre for experimental purposes were obtained from eggs inoculated with allantoic fluid but by the amniotic route; with Iris sufficiently high-titre fluids could not be obtained and the strain has not been fully examined.

Virulence of the New Strains for the Chick Embryo

Table I shows the early amniotic passage history of the four strains. It soon became evident that HAL was highly lethal to the embryos, most of the recorded deaths occurring within forty-two hours of inoculation. The dead embryos showed consistent lesions. They were smaller and more poorly developed than uninoculated embryos of the same age and their bodies were deeply congested, being purplish or bright scarlet in colour with dilated and prominent blood-vessels. Petechial hæmorrhages were sometimes present in the skin and skeletal muscles, especially in the pectoral regions. The liver and kidneys were always deeply congested with widely dilated blood-vessels, the lungs often congested. On the posterior aspect of the head the venous plexus overlying the brain showed extreme engorgement in nearly every case and was clearly visible through the skin of the head. The meninges were distinctly pink and vessels were often visible in the brain tissue.

The lesions were apparently a terminal or near-terminal event, since they were present only in dead or moribund embryos. Histological examination confirmed the extreme congestion and revealed cellular degeneration in most organs, but no cellular reaction was detected in any tissue of the body.

The macroscopic lesions closely resemble those produced by the virus of Newcastle disease, and since this virus was at the time being passed in a separate part of the laboratory it was necessary to exclude the possibility of contamination from this source. Serum neutralisation tests showed conclusively that there had been no such contamination.

Though some deaths occurred, the early passage history of the remaining strains was not so dramatic; nor did the dead embryos present so striking an appearance. The behaviour of strain M.W. nevertheless suggests that, with increasing adaptation of a virus to growth in the embryo, lethal properties may be acquired and this possibility is supported by the fact that our PR8 strain when inoculated amniotically causes death with severe lesions even at a dilution of 10^{-6}. It may be that most strains would acquire such virulence on long-continued amniotic passage but HAL by killing 6 out of 7 embryos as early as the 3rd pass appears to be unique.

These findings are in direct contradiction to those of previous workers who have stated categorically that influenza virus passed amniotically has never, in their experience, produced demonstrable lesions other than in the lungs, and that the external appearance of the embryos has always been normal (Burnet 1940a and b, Burnet and Foley 1941, van Rooyen and Rhodes 1948). Lesions of the type here described have been observed only in the case of two strains of exalted virulence following prolonged passage on the chorio-allantoic membrane (Burnet 1936, Burnet and Lush 1938). A further description of our findings and their implications with respect to those of previous workers will be published separately but it is possible that the discrepancy is attributable to our use of eight-day or ten-day, as opposed to thirteen-day, embryos.

The significance of the lesions is difficult to assess. There is no doubt that they are produced by the virus itself, for they can be entirely prevented by means of specific immune sera. Their general character, however, does not suggest that they are specific to influenzal infection. Indeed one uninoculated control embryo showed lesions very similar in character, though minor differences were apparent both macroscopically and microscopically. In particular this embryo was far more cyanotic than infected embryos and histologically did not show cellular degeneration. We are inclined to regard the lesions as a non-specific reaction to severe infection or toxæmia, but further work is required.

Neurotropic Properties of Strain HAL

Although the lesions did not indicate a localised site of multiplication of the virus, the macroscopic appearance of the head, together with the congestion of the brain tissues which was revealed by microscopic examination, recalled the description by Stuart-Harris (1939) of mouse brains infected with the neurotropic variant of W.S. virus, and suggested that the HAL strain might possess neurotropic properties. Rigorous proof of influenza virus multiplication in any specific organ of the chick embryo is virtually impossible, but an infectivity titration of brain tissue, with precautions against contamination from the amniotic fluid or from superficially adsorbed virus, gives an estimate of the virus content of the brain at the time of harvesting. In two such titrations 0·2 ml. of the supernatant fluid from a 10% *w/v* suspension was infective for 1 out of 3 embryos at 10^{-4} dilution. Since the great majority of the tissue was thrown down on centrifugation this probably represents an infectivity titre in brain tissue of well over 1/500,000. Burnet (1936) recovered virus from the brain of an embryo dead with hæmorrhagic encephalitis following infection with his highly virulent Melbourne strain, but he concluded that most of it was associated with the blood-cells present. The brains used in the present titrations were not hæmorrhagic. The extradural venous sinuses which gave so striking an appearance to the head of the embryo, and the congested meninges, were excluded and the suspensions were made from brain tissue which contained insufficient blood even to tinge them. The high content of virus could only be accounted for, therefore, by virus multiplication in the brain or by some process of selective concentration of circulating virus by the brain tissue. The latter possibility seems unlikely, but either explanation would imply neurotropism on the part of the virus. The fact that PR8 can produce similar lesions in the embryo suggests that it, and possibly other strains, may also be capable of multiplying in the brains of young chick embryos and that the acquisition of neurotropism is not due to an excessively rare mutation as has previously been supposed.

Sensitivity of the New Strains to Non-specific Inhibitors

Before attempting to investigate the antigenic relationships of the new strains by the hæmagglutination inhibition test, it was necessary to test their sensitivity to non-specific inhibitors of hæmagglutination such as are present in the sera of most animal species. When tested against normal rabbit sera their sensitivity was found to be abnormally high. Such sera normally inhibit hæmagglutination of our PR8 strain to a titre of 40–100 and of Lee to a titre of 150–600. Their titres against HAL on the other hand varied from about 300 to over

TABLE II—EFFECT OF R.D.E. TREATMENT OF NORMAL RABBIT SERUM ON ITS INHIBITORS AGAINST LEE AND HAL VIRUSES

Serum	Virus		Times of serum incubation (hours) 0	2	6	24	48
With R.D.E.	Lee	L	333	19	19	..	..
		H	1396	44	17	..	..
	HAL	L	557	239	277	320	370
		H	741	160	179	196	262
With saline (control)	Lee	L	333	143	178	..	211
		H	1396	707	877	..	1396
	HAL	L	557	301	366	..	493
		H	741	394	518	..	600

L, Living virus. H, Heated virus.

1500. This precluded the use of untreated antisera for the differentiation of minor degrees of antigenic crossing. An attempt was, therefore, made to eliminate non-specific inhibitors by treatment of serum with the R.D.E. of *V. cholerœ* (Burnet and Stone 1947, van der Veen and Mulder 1950).

In preliminary experiments aliquots of undiluted normal rabbit serum were mixed with equal volumes of a range of dilutions of R.D.E. and incubated at 37°C overnight. The mixtures were then heated at 56°C for thirty minutes to destroy the R.D.E. and titrated against 4 A.D. of the appropriate living viruses. Such experiments showed a clear optimum for R.D.E. concentration, at 1/5 to 1/10 dilution, a finding already reported by Isaacs and Bozzo (1951), but though inhibitors to PR8 and Lee were completely destroyed at this concentration the activity of the serum against HAL was only partially reduced.

Investigation of the time-relationships of the reaction provided clear evidence that this difference of behaviour is not merely due to an abnormal sensitivity on the part of HAL virus leading to the detection of residual inhibitor remaining in the serum as a result of incomplete R.D.E. action. Table II summarises the results of an experiment in which aliquots of normal rabbit serum were incubated at 37°C with and without R.D.E., samples withdrawn at various time-intervals being tested for

TABLE III—COMPARISON OF INHIBITOR SUSCEPTIBILITIES OF NEW AND STANDARD VIRUS STRAINS

Normal rabbit serum	Virus (4 A.D.)									
	Lee		F.M.1		HAL		N.G.		M.W.	
	L	H	L	H	L	H	L	H	L	H
Untreated ..	355	1902	403	3620	666	913	610	669	520	1616
R.D.E. treated ..	20	20	20	50	214	140	232	195	136	141

inhibitor activity against Lee and HAL viruses both living and heat-killed. Simple incubation of the serum without R.D.E. resulted in an initial fall of inhibiting potency against both viruses followed by a progressive rise. This phenomenon of restoration of activity on long-continued incubation has been observed in several other experiments and indicates that the initial fall is due, not to inhibitor destruction, but to some reversible change in the serum components. The R.D.E.-treated serum showed no such reversible change when tested against Lee virus; its activity was almost completely abolished after two hours' treatment and the loss was permanent. There can be little doubt that in this case the inhibitor concerned was actually destroyed. The behaviour of the R.D.E.-treated serum against HAL virus, however, was essentially the same as that of the untreated control serum but with somewhat lower titres throughout. These findings cannot be explained as an extreme example of the inhibitor gradient but must depend on the existence in normal rabbit serum of a second inhibitor insusceptible to destruction by the R.D.E. preparation in use in our laboratory. This R.D.E.-resistant inhibitor appears to be more effective against living virus than against heated virus—an effect directly contrary to that of inhibitors of the normal type.

Using the standard overnight treatment of serum with R.D.E. the three new strains were tested in parallel with both Lee B virus and the A-prime reference strain F.M.1. The results given in table III show that sensitivity to this second inhibitor is not peculiar to the HAL virus but is shared by the other 1951 strains. It is, however, not a characteristic of A-prime viruses as such, for the F.M.1 virus behaved exactly like Lee B virus.

A further contrast between the old and the new strains is also illustrated in tables II and III. The heated virus preparations were treated at 56°C for thirty minutes. This treatment usually increases the sensitivity of the virus to inhibitor with consequent rise of serum titre, an effect known as the Francis phenomenon (Francis

TABLE IV—FRANCIS RESPONSE OF HAL STRAIN AGAINST VARIOUS NORMAL RABBIT SERA

HAL virus preparation		Normal rabbit sera	Serum titres against 4 A.D. of virus L	H	H/L ratio
A1	4.. ..	A	710	1460	2·1
,,	6.. ..	B	383	425	1·1
,,	8.. ..	C	1325	1146	0·9
Eluate	10.. ..	,,	1510	493	0·3
A1	8.. ..	D	417	271	0·6
,,	8.. ..	,,	1085	1148	1·1
,,	8.. ..	,,	557	741	1·3
,,	8.. ..	,,	619	753	1·2
A1	9.. ..	,,	333	368	1·1
Eluate	12.. ..	,,	1025	485	0·5
,,	12.. ..	,,	1595	2100	1·3
A1	13.. ..	,,	1211	1660	1·4

1947). The Francis responses of the new strains shown in the tables are very much smaller than those of Lee or F.M.1, and further experiments with HAL virus showed that the effect might even be reversed. Table IV summarises twelve experiments in which various virus preparations, living and heated, were tested against several normal rabbit sera. The changes of virus sensitivity induced by heat treatment varied from experiment to experiment and can best be compared by consideration of the H/L titre ratios, which ranged from 2·1 to 0·33. Ratios between 1·2 and 0·8 do not represent a significant change in sensitivity. In four experiments, however, sensitivity to inhibitor was significantly increased and in three experiments significantly decreased. With the exception of our 1951 strains, a decrease has never been observed by us with any virus; nor are we aware of it having been reported. Further significance is given to these observations by the orthodox behaviour of the strain HAL when tested against egg-white inhibitor as illustrated in the experiment shown in table V.

It is evident therefore that rabbit serum contains two qualitatively distinct types of inhibitor. The first,

TABLE V—SENSITIVITY OF LEE AND HAL STRAINS TO SERUM AND EGG-WHITE INHIBITORS

Virus		Inhibitory titres Normal rabbit serum	Egg-white 1/10
Lee	L	601	20
	H	2318	2228
HAL	L	1085	80
	H	1148	4457

affecting PR8, Lee, F.M.1, and the new strains, is sensitive to R.D.E., inhibits heated virus more strongly than living virus, and is responsible for the pronounced Francis responses of the older strains. This type has been termed α inhibitor (Smith and Westwood 1949) and its behaviour resembles that of egg-white. The second type, which may be termed β inhibitor, affects the new strains only. It is insensitive to R.D.E. and inhibits living more strongly than heated virus. With untreated normal rabbit serum, the Francis response of HAL attributable to α inhibitor is largely neutralised or even reversed owing to the influence of β inhibitor.

ANTIGENIC RELATIONSHIPS OF THE NEW STRAINS

Hæmagglutination Inhibition Tests

In view of the insusceptibility to R.D.E. of the β inhibitors the antigenic relationships of the new strains were studied by the hæmagglutination inhibition test using specific antisera untreated with R.D.E., and significance was attached only to major degrees of cross-reaction.

In the experiment shown in table VI the only significant crossings occurred between HAL and F.M.1 strains.

TABLE VI—ANTIGENIC RELATIONSHIPS OF HAL TO THE STANDARD INFLUENZA VIRUS TYPES

Virus strains	Titres of specific antisera			
	PR8	Lee	(Ferret) F.M.1	HAL
PR8	*1746*	<80	185	<80
Lee	137	*871*	<80	202
F.M.1	204	444	*1924*	1199
HAL	427	663	1325	*3009*

Another experiment set out in table VII shows that the new strains are as closely related to F.M.1 as they are to each other, and must therefore be regarded as falling within the A-prime group of strains rather than as being a distinct though related group.

It is also apparent that HAL is more easily inhibited than the other strains; for the titres of M.W. and N.G. antisera are higher against HAL than against their homologous viruses. This may depend upon differences in surface configuration which allow more or less efficient coverage of the virus receptors by the antibody molecules. Such differences in surface configuration would not necessarily affect antigenic specificity and thus might well determine differences of biological behaviour in strains which are indistinguishable by the orthodox methods of serological analysis. The effects of distortion of surface configuration upon virus inhibitor reactions have been discussed by Smith and Westwood (1950), and a similar explanation has been postulated by Standfast (1951) to account for differences in agglutinability of serologically identical strains of freshly isolated *Hæmophilus pertussis*.

Complement-fixation Tests

The conclusion reached from the relatively crude results of the hæmagglutination inhibition tests were fully confirmed by the more precise complement-fixation technique.

F.M.1, HAL, M.W., and N.G. were found to be closely related to each other, the differences between F.M.1 and the new strains being of the same order as those between the new strains themselves. A measurable cross-reaction was also found between the new strains and PR8 by this technique.

TABLE VII—ANTIGENIC RELATIONSHIPS OF THE NEW STRAINS AND F.M.1 VIRUS

Virus strains	Titres of specific antisera			
	F.M.1	HAL	N.G.	M.W.
F.M.1	*2813*	4200	3067	1881
HAL	1742	> *10,240*	4281	3365
N.G.	1940	2996	*3406*	2135
M.W.	1546	6304	2841	*2484*

Mouse Adaptability

Most influenza-A and A-prime strains of virus are capable of adaptation to growth in mouse-lung with production of consolidation, and the mechanism of adaptation has been studied by Hirst (1947). Intranasal inoculation of high-titre allantoic fluid from infected embryos will frequently cause lesions in mice without previous adaptation of the virus, but this is regarded as a function of toxicity rather than infectivity. Thereafter in consecutive passes using mouse-lung material, influenza virus may, as Hirst has shown, be capable of multiplication to high titre; but the power to produce specific lesions is acquired only after a varying number of passes. The HAL strain, however, not only produced lesions on primary inoculation into mice but continued to do so with regularity throughout a long series of mouse-to-mouse passages using lung suspensions inoculated by the intranasal route. Swiss mice weighing 18–20 g. were used in these experiments. At each pass 6 mice were inoculated, 3 being killed at the third or fourth day for passage and 3 after six or eight days for assessment of lung lesions. The primary inoculum was allantoic fluid, with a hæmagglutination titre of 96, obtained from the 10th amniotic passage in eggs. Thereafter centrifuged 5% mouse-lung suspensions were used, undiluted for the first 7 passes and diluted 10^{-1} or 10^{-2} for subsequent passes. At the 7th pass the mouse-lung preparation was clarified through paper pulp and filtered through a 0·73 μ gradacol membrane. The filtrate was titrated in groups of 3 mice per dilution and produced specific lung lesions in all inoculated animals up to a dilution of 10^{-3}. The 3 mice inoculated with undiluted filtrate died with almost complete lung consolidation.

During the first 5 passages the lesions produced were not the sharply demarcated plum-coloured areas of typical influenzal consolidation but were more mottled and diffuse. The possibility that grey-lung virus, or some other mouse-pneumonia virus, might be responsible for the lesions was excluded by the complete protection afforded by specific antiserum prepared against infected allantoic fluid. Accidental contamination with some other laboratory virus strain had also to be considered in view of the many instances on record (Andrewes et al. 1944). During the course of the experiments and for two years previously no A-prime strain of virus had been passed in this laboratory but PR8 viruses, including a mouse-adapted strain, had been in constant use. Rigorous cross-protection tests in mice with the PR8 and HAL viruses and their corresponding specific antisera showed that they were antigenically quite distinct. Laboratory contamination as an explanation of the mouse virulence of HAL can thus be excluded.

It was recognised that this unique behaviour of HAL in mice might be due either to its intrinsic mouse virulence or to the occurrence of a chance mutation which would be most unlikely to recur at the outset of a second attempt at mouse adaptation. Allantoic fluids from the 9th allantoic egg pass of HAL and the 8th allantoic egg pass of strain M.W. were, therefore, adjusted to an equivalent hæmagglutination titre and used to initiate mouse-passage series which were carried on in parallel. In each case the first mouse pass failed to give lung lesions but all subsequent passes did so, the extent of lung involvement at each stage being closely comparable. Because of the absence of lesions at the first pass yet another adaptation experiment was made with M.W. using allantoic fluid from the 5th amniotic pass on the assumption that virulence might have been better preserved by amniotic transfer than by serial allantoic

passage. Lung lesions were produced regularly in mice from the outset up to the 6th mouse-to-mouse transfer when the experiment was terminated.

It is, therefore, evident that both HAL and M.W. strains possess unusual mouse virulence and though other strains have not been tested in the same way it is possible that such virulence may be a general characteristic of the 1951 viruses. Furthermore, the combined results of the four adaptation experiments suggest that early amniotic passage virus may adapt to mice more readily than virus more fully established in the egg by serial allantoic passage. This would imply that virus direct from human sources is more likely to be pathogenic for mice than after its egg adaptation and that failures to achieve direct isolation in mice have been due to inadequacy of dosage rather than to non-infectivity of the human material. This question is being further investigated.

DISCUSSION

In the study of epidemic strains of influenza virus, and especially in the assessment of their interrelationships, attention is usually focused upon their antigenic constitution, often to the exclusion of other properties. Such disproportionate emphasis on a single characteristic may be misleading; particularly so in investigations of influenza epidemiology in which the relative importance of specific immunity factors is still unknown. The strains isolated by us during the 1951 epidemic could not be distinguished as a group from the standard A-prime virus strain F.M.1 by antigenic analyses based upon either the hæmagglutination-inhibition or complement-fixation techniques. Nevertheless they are as clearly distinguishable from it as they are from the antigenically dissimilar influenza A, PR8, and influenza B, Lee, viruses by their reactions with normal rabbit serum inhibitors. The two strains tested differ also from all previously described strains by their initial virulence for the chick embryo and by the ease with which they can be adapted to mice. Lesions in chick embryos similar to those produced by HAL and M.W. have been previously described only in connection with Newcastle disease virus and two strains of influenza virus which had acquired such virulence after prolonged serial passage on the chorio-allantoic membrane (Burnet 1936).

The extreme virulence of HAL for the chick embryo which was fully established by the 3rd amniotic pass is possibly the most important finding of the present investigation. The strain was one of four isolated about the same time from patients in a circumscribed area. The infection of the human donor was not particularly severe notwithstanding the slight lung signs present; nor was the epidemic in London noteworthy in respect of either its symptomatology or its percentage morbidity. One cannot assume therefore that the virulence for chick embryo is a reflection of an unusually high virulence for man. It is more likely that it reflects an unusual capacity on the part of the 1951 epidemic strains for rapid virulence variation, and the mouse adaptability of both the HAL and M.W. strains lends support to this interpretation. A variation of this type occurring in the course of epidemic transmission from man to man may well have been the crucial factor in the development of the 1918–19 pandemic from influenza of the ordinary epidemic type, and the severity of the Liverpool outbreak of 1951 may indeed represent the epidemiological expression of the potentialities of the current virus strains in this respect.

At present rapid isolation of influenza viruses from cases occurring all over the world, followed immediately by their serological typing, is very largely relied on for the elucidation of epidemiological phenomena and for the development of specific measures of control of the disease. Without in any way minimising the value of antigenic analyses, we venture to suggest that these should not be unduly stressed, but that other aspects of the biological behaviour of freshly isolated strains are equally worthy of study and of being taken into account in the consideration of the many problems still presented by epidemic influenza.

SUMMARY

1. The isolation of four new virus strains during the 1951 influenza epidemic is reported. They are very closely related antigenically to each other and to the standard A-prime reference strain F.M.1.

2. The new strains differ from all previously described influenza viruses by their susceptibility to a second hæmagglutination inhibitor contained in normal rabbit serum. The term β inhibitor is proposed for this second inhibitor to distinguish it from the normal type (α inhibitor) which is active against most strains of virus. The two inhibitors show qualitative differences in respect of their action against viruses and their susceptibility to destruction by R.D.E.

3. Two of the new strains possess unusual virulence for the chick embryo, causing death of the embryo with characteristic lesions after amniotic inoculation. They are also readily adaptable to mice. Evidence of neurotropism is afforded by the strain more intensively studied.

4. The implications of the anomalous behaviour of the new strains are briefly discussed.

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TREATMENT OF THE MEGALOBLASTIC ANÆMIAS WITH CITROVORUM FACTOR

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In a preliminary communication (Davidson and Girdwood 1951) we gave an account of three patients with pernicious anæmia treated with single intramuscular injections of a preparation of the growth factor for the streptococcus *Leuconostoc citrovorum*. A short account was given of the relationship of citrovorum factor to folinic acid. At that time we believed that the material used had been prepared from a biological source, but we have since been informed that it had been synthesised in the manner described by Brockman et al. (1950).

We describe here the response obtained in further cases of megaloblastic anæmia treated with 'Leucovorin,' Lederle's preparation of the synthetic form of citrovorum factor which has recently been said to have the structure 5-formyl-5,6,7,8-tetrahydropteroylglutamic acid (Pohland et al. 1951).

Reports on the clinical use of citrovorum factor in 10 cases (comprising 4 of pernicious anæmia, 4 of tropical sprue, and 2 of nutritional megaloblastic anæmia) have been given by Spies et al. (1950), who used both folinic acid (Bond et al. 1949) supplied by Eli Lilly & Co. and leucovorin supplied by

Lederle Laboratories Inc. Of the 6 cases treated with intramuscular folinic acid 200 μg. daily for ten days, 4 showed no response and 2 had a minimal hæmatological response. On the other hand, intramuscular leucovorin 3 mg. daily for ten days produced good clinical and hæmatological responses in the remaining 4 patients.

Other reports on the use of Lederle's preparation of citrovorum factor in pernicious anæmia have been given by Meyer et al. (1951) in 5 cases, Jarrold et al. (1951) in 3 cases, and Ellison et al. (1951) in 6 cases. These groups of workers gave intramuscular citrovorum factor 0·5–3·0 mg. daily and reported submaximal or maximal increases in the number of reticulocytes and erythrocytes, with conversion of the marrow to the normoblastic state.

Woodruff et al. (1951) claimed excellent results in 2 infants with megaloblastic anæmia treated with intramuscular citrovorum factor 75 μg. daily.

The present account is of 6 additional patients with addisonian pernicious anæmia who responded satisfactorily to treatment with either intramuscular or oral leucovorin, 1 with idiopathic steatorrhœa who showed a somewhat poor hæmatological response to intramuscular leucovorin, and 2 with megaloblastic anæmia of pregnancy whom we first saw in the puerperium and who showed an excellent general and hæmatological improvement when treated with either intramuscular or oral leucovorin.

The accompanying table shows that there was an initial hæmatological improvement in all the cases, and this response was accompanied by an improvement in the general condition. In most instances we were unable, through shortage of material, to assess whether the blood-counts could be restored to normal.

In view of the fact that there are no published reports of the use of citrovorum factor in the treatment of megaloblastic anæmia of pregnancy, and no reports in this country of its use in steatorrhœa, we append some details of the patients who suffered from these conditions.

MEGALOBLASTIC ANÆMIA OF PREGNANCY AND PUERPERIUM

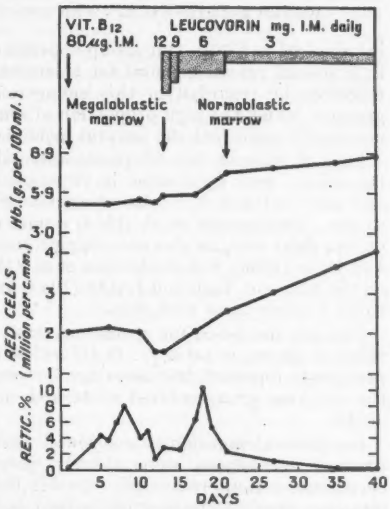
Case 10 (see table).—A married woman, aged 36, had had symptoms of anæmia during pregnancy and was first seen by

RESPONSE TO LEUCOVORIN IN MEGALOBLASTIC ANÆMIA IN WOMEN

Case no.	Age (yr.)	Diagnosis	Day	Hb (g. per 100 ml.)	Red cells (mill./ c.mm.)	Retic. %	Bone-marrow	Treatment		
								Leucovorin (mg.)	Route	Day
4	45	Pernicious anæmia	0	6·1	1·41	1·5	Megaloblastic	12	I.M.	0
			4	7·4	1·85	8·8 (peak)				
			10	9·3	2·32	1·6	Normoblastic			
			15	9·3	2·33	4·5		12	I.M.	15
			23	10·8	2·77	<1				
5	47	Pernicious anæmia	0	2·7	0·73	1·0	Megaloblastic	12	I.M.	0
			1					1¼ pints of blood		1
			3	4·7	1·21	9·6				
			5			21·6 (peak)				
			12	7·7	2·15	1·5				
			15	8·4	2·41	<1		12	I.M.	14
			29	9·6	3·15	<1				
6	74	Pernicious anæmia	0	7·4	1·86	<1	Megaloblastic	3	Oral	0–31
			4	8·4	2·06	5·9				
			6			6·4 (peak)				
			11	10·2	2·73	<1				
			13				Normoblastic			
			15	10·8	3·16					
			23	12·3	3·52	<1				
7	70	Pernicious anæmia	0	6·5	1·97	1·5	Megaloblastic	3	Oral	0–40
			5	6·7	1·79	13·4 (peak)				
			9	7·1	1·89	2·6				
			15	8·0	2·56	<1				
			25	10·1	3·24	<1				
			27				Normoblastic			
			40	13·2	5·50					
8	70	Pernicious anæmia	0	11·1	3·10	<1	Megaloblastic	3	Oral	0
			1			<1		6	Oral	1–7
			2			1		12	Oral	19
			3			2·2				
			4			4·3				
			5	12·1	3·23	15·0 (peak)				
			7			8·0	Normoblastic			
			13	13·6	4·23					
			18	12·6	4·54	3				
			26	13·3	4·75					
9	52	Pernicious anæmia	0	11·4	3·17	3·5	Megaloblasts present	12	Oral	1
			1			1·1		6	Oral	2–4
			6			1·6 (peak)				
			7	12·7	3·59	1·5	Normoblastic	12	Oral	16
			16	14·1	3·94					
			23	15·2	4·38					
10	36	Megaloblastic anæmia of pregnancy	0	5·0	2·05	<1	Megaloblastic	Vitamin B_{12} 80 μg.	I.M.	0
			7			7·8 (peak)				
			9	5·5	2·08	4·0		Leucovorin		
			12	5·6	1·56	2·6	Megaloblastic	12	I.M.	13
			17			10·4 (peak)		9	I.M.	14
			21	7·4	2·55	2·1	Normoblastic	6	I.M.	15–20
			40	8·6	4·06	<1		3	I.M.	21–40
11	35	Megaloblastic anæmia of pregnancy	0	7·1	2·46	<1	Megaloblastic	12	Oral	2
			3	7·3	2·18	2·8		6	Oral	3–11
			6			24·8 (peak)				
			11	9·5	3·20	8·4				
			22	9·9	3·56	<1				
12	67	Idiopathic steatorrhœa	0	12·4	3·45	2·2	Megaloblastic	9	I.M.	1–4
			6			5·8 (peak)	Normoblastic			
			8	13·2	3·60	4·2				
			18	14·5	4·03	<1		Folic acid 20 mg.	Oral	18–84
			25	14·8	4·08	2·1				
			84	14·1	4·91	<1				

Cases 1, 2, and 3 were referred to in our previous paper (Davidson and Girdwood 1951).

two weeks after she had given birth to a healthy male child, without much loss of blood. Her previous medical history revealed no features of note. There had been four earlier pregnancies, but there was no history of megaloblastic anæmia before or after the previous births. There was no history of diarrhœa or steatorrhœa. The patient normally partook of a good diet, except that she never ate fish. During pregnancy, however, she had much sickness even in the later months and did not eat meat or vegetables. When we first saw her, she was pale but had no œdema. A test-meal showed free hydrochloric acid to be present in the stomach; the bone-marrow was megaloblastic, and examination of the blood showed Hb 5·03 g. per 100 ml., red cells 2,050,000 per c.mm., white cells 5000 per c.mm., packed-cell volume (P.C.V.) 16·1%, mean corpuscular volume (M.C.V.) 78·5 cμ, and mean corpuscular hæmoglobin concentration (M.C.H.C.) 31·2%.



Effect of treatment with leucovorin in megaloblastic anæmia of puerperium (case 10).

The accompanying figure shows that there was a moderate reticulocyte response to intramuscular vitamin B_{12} 80 μg. but no change in the marrow picture. There were fewer red cells on the twelfth day than when treatment started. There was an excellent response to intramuscular leucovorin, the red cells increasing from 1,560,000 to 4,060,000 per c.mm. in 27 days.

Case 11 (see table).—A married woman, aged 35, had had symptoms of anæmia during pregnancy, but she was not seen by us until fourteen days after she had given birth to triplets, without undue loss of blood. She said she had "always been anæmic," and in her four previous pregnancies and also at other times she had been treated with ferrous sulphate. There was, however, no previous diagnosis of megaloblastic anæmia or other illness of note. There was no history of diarrhœa or of steatorrhœa, and the dietetic history was satisfactory. When we first saw the patient she was pale but not œdematous. Her spleen was just palpable, and a systolic murmur was heard over the præcordium. A test-meal showed free hydrochloric acid to be present, and the marrow was megaloblastic. Examination of the blood showed Hb 7·1 g. per 100 ml., red cells 2,460,000 per c.mm., white cells 5600 per c.mm., P.C.V. 21%, M.C.V. 85·4 cμ, and M.C.H.C. 33·8%.

The patient's domestic arrangements were such that she could only remain in hospital for a short time, and it was impossible to undertake a preliminary test with vitamin B_{12}. Leucovorin was given to this patient by mouth and it will be seen from the table that there was an optimal reticulocyte response, together with a change in the marrow picture and an increase in the number of red cells.

IDIOPATHIC STEATORRHŒA

Case 12 (see table).—A married woman, aged 67, gave four years' history of diarrhœa and anorexia, the bowels moving about four or five times a day in the four months before admission. The motion was latterly completely fluid, frothy, and light brown. There had been a loss of about 28 lb. in weight, but no sore tongue and no œdema. There were no other previous illnesses of note, and the patient had not been abroad. There was no history of cœliac disease.

The patient was rather thin, but there was no clinical evidence of specific vitamin deficiencies, and Chvostek's sign was negative. No other clinical abnormality was found. The gastric juice contained free hydrochloric acid after histamine had been given. A fat-balance estimation showed a percentage absorption of only 66·6 of fat (normally 90–95). The marrow contained megaloblasts, and examination of the blood showed Hb 12·4 g. per 100 ml., red cells 3,450,000 per c.mm., white cells 9000 per c.mm., P.C.V. 32·5%, M.C.V. 94·2 cμ, and M.C.H.C. 38·1%. Intramuscular leucovorin 9 mg. daily was given for four days and, as the table shows, a hæmatological response occurred. Possibly the results achieved might have been better if leucovorin had been given in larger amounts or for a longer period than four days. The diarrhœa continued, but the patient said she felt better. There was no gain in weight. The further administration of pteroylglutamic acid 10 mg. twice daily for sixty-six days led to a further increase in the number of red cells, together with a reduction in the number of stools, which became more formed, and an improvement in appetite.

SUMMARY

A good clinical and hæmatological response was obtained in 6 cases of addisonian pernicious anæmia and 2 cases of the megaloblastic anæmias of pregnancy from the administration of leucovorin both by injection and by mouth.

The effects produced in one case of idiopathic steatorrhœa were much less striking.

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RADIOTHERAPY AND TESTICULAR NEOPLASMS

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It is insufficiently appreciated that X-ray therapy renders the prognosis in testicular neoplasms relatively favourable. These tumours include some of the most rapidly growing and widely disseminating cancers, which are only amenable to surgery when the disease is confined to the primary site. Once metastatic spread has occurred and the lymph-nodes in the para-aortic or iliac areas have become involved, radical surgical intervention becomes of very problematical value, both because of technical difficulty and because the full extent of the disease is usually impossible to determine. The classical para-aortic lymph-node secondaries are difficult to detect, unless they have grown large enough to be palpable through the anterior abdominal wall, by which time infiltration into neighbouring structures has taken place, and spread beyond the abdomen is probable. Earlier diagnosis of secondary spread can seldom be made by means of the Aschheim-Zondek or similar tests, which are usually positive only when extensive growth is present, while a negative result does not mean that metastases are absent. Estimations of hormone excretion have been no more successful. The general clinical picture then, is one of a removable primary testicular growth, but with lymph-node metastases which may not be detected before they are far advanced.

RESULTS OF ORCHIDECTOMY

That this is a true representation of the events is shown by the survival figures for patients treated by simple orchidectomy alone. Hinman (1933) has reported a 5·6% five-year survival of 258 cases collected from the literature, and Tanner (1922) similarly found a 5% four-year survival of 425 cases. Higgins and Buchert (1939) had 24% of five-year survivors from 25 cases selected as having no initial metastases, and Tanner 29% four-year survival from 59 similar cases. Cabot and Berkson (1939) showed a 48% gross survival in a subgroup of 31 cases treated by orchidectomy alone. In their complete group of 363 cases, however, the great majority were treated by X rays at some time or other in the course of the period of observations. It would appear, therefore, that the 31 cases represented those that did not receive X-ray treatment because metastases never occurred, and as such was a highly selected group. Hence at the best some 25–30% of patients can be cured by simple orchidectomy, but only if the diagnosis is made early.

In an effort to improve this state of affairs, radical dissection of the regional lymph-nodes has been carried out, notably by Hinman (1933), at the same time as or shortly after, the initial orchidectomy. The results of this procedure were more favourable; a 20% five-year survival-rate is reported by him in a series collected from American surgeons which included cases both with and without metastases. He came to the conclusion

TABLE I—AGE-DISTRIBUTION

Age-group centred at	5 and under	10	15	20	25	30	35	40	45	50	55	Over 60
Seminoma ..	0	0	2	3	8	17	19	15	11	12	8	1
Teratoma ..	1	0	0	3	1	3	3	2	3	0	1	0
Unclassified ..	0	0	0	0	2	1	2	4	2	3	0	1

Mean age for seminoma = 40. Mean age for teratoma = 35.

that the radical operation was of value only in the case of the teratoma without clinical metastases. For all stages of seminoma be believed that radiation gave better results, and for teratoma with metastases, that the disease was always more widely spread than could be determined, and operation did not avail.

PRESENT SERIES

The results of radiotherapy are well established and figures in the region of 50% five-year survivals of all cases are commonly reported. A distinction should, however, be made between the figures for seminoma and those for teratoma, which between them account for the great majority of testicular neoplasms. The former show a very good radiotherapeutic response whilst the latter are much less favourable. The incidence and site of metastases also has a marked bearing on the prognosis.

This paper reports 128 cases of testicular neoplasms treated at the Christie Hospital, Manchester, between 1936 and 1945. All cases are included whether they were treated or not. Those in which the tumour was a seminoma, a carcinoma of the seminal epithelium, or an embryonal carcinoma have been classified as seminoma and number 96. Those histologically reported to be malignant teratoma, adenocarcinoma, or chorion carcinoma, have been classified as teratoma and number 17. The remaining 15 are unclassified because the pathological findings are not known or a more precise definition is impossible. Thus seminoma accounts for 85% of all the histologically verified cases, a greater proportion than commonly reported. Barringer (1944) reports 82% but Tanner (1922), Desjardins et al. (1929), and Cabot and Berkson (1939) all give percentages

TABLE II—PRESENCE OF METASTASES ON FIRST EXAMINATION

Type	No.	Group A. No metastases	Group B. Abdominal metastases	Group C. Distant metastases
Seminoma ..	96	50 (52%)	29 (30%)	17 (18%)
Teratoma ..	17	10 (59%)	4 (23%)	3 (18%)
Unclassified ..	15	2 (13%)	6 (40%)	7 (47%)
All types ..	128	62 (48%)	39 (30%)	27 (22%)

Without metastases 48%. With metastases 52%.

between 60 and 70. Our group consists of cases referred to a special cancer hospital for treatment; they should therefore be regarded in this connection as a selected group in which the high proportion of seminoma does not necessarily represent the natural incidence.

It is of interest, but of questionable significance, that the lesions were right-sided in 79 cases, left-sided in 44, and unrecorded in 5, a ratio of right to left of nearly two to one. Pendergrass et al. (1946) reported more tumours on the right side, as also did Higgins and Buchert (1939) and Dean (1935), but Desjardins et al. (1935) found more on the left, and Nash and Leddy (1943) an approximately equal number from each side.

The age-incidence for seminoma and teratoma separately is shown in table I. It differs but little from those previously reported, the mean age for seminoma being in the five-year group centred at 40 and that for teratoma at 35.

On first examination it was found that in 52% of the patients metastases were already present, and their occurrence was approximately equal in the seminoma and teratoma groups. In view of the hearing that metastases have on the prognosis, the whole group has been subdivided into those having no demonstrable metastases (group A), those with intra-abdominal metastases only (group B), and those with extra-abdominal metastases (group C); the respective proportions are shown in table II. For the purpose of this classification, those cases which showed recurrence in the scrotum or the operation scar, or in which malignant cells were present in the cut end of the cord on histological examination were classified as having intra-abdominal metastases. The figure of 52% for the incidence of metastases when first seen compares with one of 45% in 754 unselected cases which we have compiled from the literature.

RESULTS OF RADIOTHERAPY

The results of radiotherapy are shown in table III and are given as gross survival-rates five years after the initial treatment. Trace was lost of 4 cases and 3 died of intercurrent disease, but all have been counted as having died of neoplasm. With one exception all cases had had a preliminary orchidectomy. In no case that survived five years was there evidence of residual neoplastic disease at the end of that period.

Seminoma has a much more favourable prognosis than teratoma; no less than 80% of cases with no initial clinical evidence of metastases survived five years. This

TABLE III—5-YEAR SURVIVAL FOLLOWING ORCHIDECTOMY AND X-RAY THERAPY

Group	Seminoma		Teratoma		Unclassified	
	No.	No. alive	No.	No. alive	No.	No. alive
A ..	50	40 (80%)	10	5	2	2
B ..	29	12 (41%)	4	1	6	1
C ..	17	2 (12%)	3	0	7	0
All groups	96	54 (57%)	17	6 (35%)	15	3 (20%)

All tumours 128. 5-year gross survival 49%.

compares with the figure of some 25% already quoted for orchidectomy alone on comparable cases. There would seem to be good reason to conclude that following orchidectomy, all cases of seminoma should be given radiotherapy, even if no metastases can be demonstrated. With metastases confined to the abdomen, the survival-rate for seminoma drops to 41%, which is, however, considerably higher than in most other carcinomata that have metastasised locally. This indicates that the seminoma is a highly radiosensitive tumour. Included in this group are several cases which have subsequently developed either mediastinal or pulmonary spread in addition to abdominal metastases, but which have survived with further treatment for more than five years. Of those showing distant metastases when first seen, 2 have survived five years. In each case the extra-abdominal deposit was small and was not pathologically proved, but it was associated with abdominal metastases and responded as if it were neoplastic. No case with initial pulmonary metastases has survived.

Teratomata in group A show 50% of survivors; but only 1 case out of the 7 which had metastases of any kind when first seen has survived. Scheetz and Leddy (1946) and Smith et al. (1935) were of the opinion that metastases from a teratoma could not be cured by radiation and none of their cases survived. The inference is that those in group A who survived, did so because the initial orchidectomy removed all neoplastic cells that were present. The remaining 50% in this group presumably had undetected metastases when the orchidectomy was performed and the subsequent radiation did not destroy them. The one survivor in group B was a child of 20 months, who after the operation developed recurrences in the scrotum and contralateral inguinal region. Local treatment was given and the disease resolved with no subsequent spread, but the iliac and para-aortic regions were never irradiated.

Many types of malignancy may arise in a teratoma of the testis, and there is little reason to doubt that seminoma may be one variety of such change. Teratoma and seminoma often occur together in the same testis, and it has been stated, though not uniformly accepted, that seminoma always arises as the result of neoplastic change in a teratoma. Although in our opinion, which is based both upon the results presented here and upon those of other cases that have not yet had the opportunity of five-year survival, secondary spread from a malignant teratoma has a very bad prognosis, it is nevertheless wise to treat such patients with X rays. Both Barringer (1944) and Cabot and Berkson (1939) have reported a few survivors among such cases.

In our series, 4 patients had malignancy in an undescended testis, 3% of the total number; a smaller proportion than the 6% reported by Prossor (1951) and the 9% by Nash and Leddy (1943). In 1 case with no evidence of metastases the patient has survived; the remaining 3 all had intra-abdominal metastases and 1 of these has also survived five years. The tumour was a seminoma in each case.

When the initial orchidectomy is performed, the greatest care should be taken to remove the organ without damaging the tunica albuginea and the cord should be cut as high in the abdomen as is consistent with the simple operation. Whenever practicable the skin incision should not be prolonged downwards into the neck of the scrotum, since this tends to delay healing and prolongs the interval before X-ray treatment can be given. We have observed that such scrotal scars are not infrequently the site of skin metastases, presumably arising from cells spilt at the operation, whereas in abdominal scars this very rarely happens. It is advisable to perform orchidectomy even if metastases are known to be present, for thereby the pathology of the tumour is determined, and treatment by the radiotherapist is simplified. X-ray treatment should begin within a day or two of the removal of the sutures; any delay can only worsen the prognosis.

These results of orchidectomy and radiotherapy do not differ greatly from those reported in the recent past by other radiotherapy centres. In our experience the favourable results obtainable are not widely known and consequently many cases are not being given the chance of treatment. It is not enough to perform an orchidectomy for a testicular tumour and to send the patient for radiation only when frank metastases have occurred. This procedure halves the patient's chances of survival. All cases should be given X-ray therapy immediately after orchidectomy, whether there are secondary deposits present or not.

SUMMARY

Simple orchidectomy for testicular tumours has been successful in eradicating the disease in only 25% of the early cases.

Simple orchidectomy followed by X-ray therapy has been successful in 49% of all cases. In early cases of seminoma a five-year survival-rate of 80% has been obtained by this method, but the prognosis for teratoma is much less favourable.

Every case of testicular neoplasm which has been treated by orchidectomy should be referred for X-ray therapy, irrespective of the nature of the tumour or the presence of metastases.

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TREATMENT OF HUMAN ASCARIASIS WITH HETRAZAN

THE USE OF A SYRUP CONTAINING 1-DIETHYLCARBAMYL-4-METHYL PIPERAZINE DIHYDROGEN CITRATE (HETRAZAN)

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ASCARIASIS is probably the most prevalent cosmopolitan helminth infection, for it has been estimated that 644 million persons are infected with *Ascaris lumbricoides* (Stoll 1947). Chandler (1929) said that this worm has undoubtedly been one of man's most faithful and constant companions from time immemorial, and has clung to mankind through the stone, copper, and iron ages up to the present day. He predicted that modern plumbing will eventually dissolve the partnership. But, as plumbing facilities are not yet available to most of the 2000 million inhabitants of the world, the parasite will be with us for sometime yet. This view is partly substantiated by Craig and Faust (1951) who point out that "in spite of the known methods of control of human ascariasis there is very little evidence that the incidence or intensity of the infection has been appreciably reduced during the

past two decades since the epidemiology of ascariasis has been well established."

Stoll (1947) calculated that there were 3 million infected persons in Northern America; 42 million in Middle and South America; nearly 60 million in Africa, where in some areas ascariasis is said to cause more disability than any other helminth; and 355 million in China. The seriousness of this disease in China can be realised from the estimations of Winfield (1937), and those of Stoll, that the mass of adult ascarids in China is equivalent to the weight of 442,000 men, and the weight of the eggs laid by these parasites amounts to about 18,000 tons yearly. The amount of nourishment given to these prolific parasites by the mass of infected humans in China alone can be easily understood.

If the nutritional deficits were the only ill effect produced by *A. lumbricoides* in infected populations, it would be reason enough for attempting to eliminate the parasite. Unfortunately in eradication campaigns in many areas the injurious effects of the ascaris have usually been overlooked, while those of hookworm have been overemphasised. Almost from the time of its entry into the human host ascaris can produce serious reactions. The migration of the larvæ through the lungs, particularly in heavy infections, causes hæmorrhages in the lungs and even a hæmorrhagic pneumonia which may be fatal. In the intestinal tract, after the adult ascarids become established, they may remain relatively quiet, and, unless numerous, usually produce only mild colicky pains and indigestion. At times the host first becomes aware of his parasite when he passes a single living or dead worm at defæcation or vomits an ascaris during a gastro-intestinal upset. When the ascaris are numerous and are irritated, they "ball up" and may cause intestinal obstruction. This phenomenon may also occur when the patient is given an ineffectual medicine that only irritates the worms instead of stunning or killing them. At times, ascaris acquire a wanderlust and find their way into viscera such as the appendix, the bile-ducts, and even the liver; sometimes in patients who are sick and moribund from other causes, they may travel through the stomach to emerge from the mouth, nose, and even the auditory canal. They are known to penetrate the intestinal wall and having entered the peritoneal cavity give rise to peritonitis. The toxic products of *A. lumbricoides* have deleterious effects on several systems including the cardiovascular and nervous systems. They are believed by some workers to damage the glands of internal secretion and the reproductive system. Yokogawa and Wakejima (1932) have reported that children infected with ascaris are physically underdeveloped, and mentally less alert than uninfected children, but that after expulsion of the worms their nutrition improves as well as their scholastic ability.

Anhelminthics, as in the case of other intestinal worm infections, have been limited in ascariasis to but a few preparations. Though, over a number of years, some have been found to give good results, many are so toxic that some patients have died after treatment. Oil of chenopodium is an effective ascaricide but like santonin is definitely a toxic substance, and the toxicity of both is usually augmented by the poor physical condition of the patient, especially children who have heavy worm burdens and are malnourished. Hexylresorcinol, better known as 'Crystoids Anthelmintic,' was introduced as a treatment for ascariasis in 1937, and with it the problem of serious systemic toxicity was overcome. However, this drug is available only in hard gelatin capsules and is therefore difficult to administer to small children. Although there are no major systemic manifestations of toxicity, a singular disadvantage of hexylresorcinol is that if the capsules are chewed or broken in the mouth they will cause chemical burns of the buccal and œsophageal mucous membranes. All of these drugs require for maximum effectiveness either fasting or restricted diets, and purges before, with, or after therapy. Oil of chenopodium is best tolerated when the patient is at rest in bed.

Hewitt et al. (1948) reported that a new preparation, 1-diethylcarbamyl-4-methyl piperazine hydrochloride ('Hetrazan'), which had previously been found to be effective in treating filariasis in cotton-rats and dogs, was also effective in treating ascariasis of dogs. Later, Oliver-Gonzales et al. (1949), having studied the effects of hetrazan on filariasis in humans, reported the results in 6 cases of human ascariasis treated with this drug. Each patient was given three doses of 2 mg. per kg. body-weight in one day; all the worms were expelled from 3 patients, while in the other 3 cases there were reductions in the egg-counts by 83·4–99·5%.

Etteldorf and Crawford (1950) reported on the treatment of ascariasis with hetrazan (dihydrogen citrate salt) in 15 children. In most of the cases they gave doses of 6 mg. per kg. three times daily for seven days. Two weeks and one month after treatment with hetrazan there were no ascaris ova in the fæces of 10 of the children. Though they did not ascertain the intensity of the worm burdens they were of the opinion, nevertheless, that this drug was very effective.

Using doses of 2–3 mg. twice daily for three successive days, Ruiz-Reyes et al. (1950) concluded that the ease of administration and the low toxicity of hetrazan make it useful in treating small children who cannot swallow pills or capsules, although they believed it was not the best drug for ascariasis.

On the basis of the reports of Hewitt et al. (1948) and of Oliver-Gonzales et al. (1949) as well as a preliminary review of the results obtained by Etteldorf and Crawford (1950), we began studies of the treatment of ascariasis with hetrazan (dihydrogen citrate salt) in

TABLE I—EFFECT ON EGG-COUNT OF SYRUP OF HETRAZAN 13 MG. PER KG. BODY-WEIGHT PER DAY FOR THREE DAYS

Patient	Eggs per gramme			% reduction
	1st day	7th day	14th day	
1	22,000	2400	10,000	55
2	12,000	600	600	95
3	42,000	800	400	99
4	3900	2000	4800	0
5	11,700	2400	900	92
7	800	0	0	100
8	10,200	2000	0	100
10	3600	1500	0	100
15	64,800	600	3600	94
16	85,200	0	0	100
18	22,000	0	0	100
19	22,000	0	0	100
20	6200	1500	6400	0
21	7200	0	0	100
22	7600	1200	300	97
23	36,200	24,400	18,800	48
24	2400	400	600	75
25	10,800	0	0	100
26	108,800	34,200	18,600	83
27	122,800	79,500	7200	94
28	11,400	600	0	100
29	2400	600	0	100
30	8400	28,200	2800	68
31	6000	0	0	100
32	16,800	0	0	100
33	6900	3200	800	88
34	12,400	2600	11,200	10
35	54,400	15,800	37,400	31
36	16,800	0	0	100
37	2400	1000	1200	50
38	28,400	2000	2700	90
39	5800	400	0	100
40	6400	0	0	100
41	20,800	8800	1500	93
42	6600	1600	3000	54
43	94,600	64,400	24,000	75
44	25,800	800	800	97
45	21,200	0	0	100
46	182,400	800	6000	97
47	16,000	800	2400	85
48	15,000	3900	4000	73
49	8800	800	400	95
50	30,400	800	0	100

TABLE II—EFFECT ON EGG-COUNT OF SYRUP OF HETRAZAN 13 MG. PER KG. FIRST DAY; 20 MG. PER KG. ON THE SECOND AND THIRD DAYS

Patient	Eggs per gramme			% reduction
	1st day	7th day	14th day	
87	61,200	0	0	100
88	60,000	5200	19,800	67
89	6600	0	2000	69
90	17,400	0	0	100
91	3000	0	0	100
92	3400	0	0	100
93	5000	0	0	100
94	145,000	4000	6400	96
95	260,000	0	0	100
96	5200	0	0	100
97	4800	5400	0	100
98	40,000	15,000	4000	90
99	52,800	2400	800	98
100	36,600	10,800	4000	89
101	10,400	0	0	100
102	22,000	0	0	100
103	10,800	0	0	100
104	8800	1600	400	95
105	10,400	0	0	100
106	26,800	0	0	100
107	4800	0	0	100
108	32,000	0	0	100
109	600	0	0	100
110	18,000	2400	2400	87

Haiti, in March, 1950. During the next two months 26 patients infected with *A. lumbricoides* were treated with doses of 6 mg. of hetrazan per kg. body-weight three times daily for five days. Samples of fæces were examined by the S.A.E.X. concentration technique (Loughlin and Spitz 1949) for ova of ascaris, as well as for ova of other helminths; and counts of the ova were made, according to the technic of Stoll (1923), before treatment with hetrazan, and on the third, fifth, eighth, and fourteenth days after the end of treatment. The worm burdens of these patients ranged from 2 to 266 ascaris. By the fourteenth day it was found that the counts of ascaris ova had been reduced by 92·1% in the patients as a group. In 12 of them, ascaris ova could not be found from the eighth to the fourteenth days, while in the other patients reductions in ova-counts ranged from 63 to 97%.

In a second group of 14 patients with ascariasis, we administered doses of 10 mg. of hetrazan per kg. three times daily for three days, desiring to shorten, if possible, the course of therapy. This dosage, however, produced in practically all patients intestinal cramps and a sharp reduction of appetite, and in 6 patients vertigo and lassitude. In this group the ova-counts were reduced by 84%.

From these observations it was apparent that a dose of about 6 mg. of hetrazan per kg. given three times daily for five days was the optimum from the standpoint of tolerance as well as effectiveness. However, we encountered the same obstacles in administering hetrazan that we experienced with other tablet preparations, in that small children had difficulty in swallowing them. In order to get them to take the hetrazan, the tablets had to be crushed and suspended in milk or taken with a mouthful of food. We also believed that if hetrazan was to become a practical field treatment of ascariasis it would be necessary to keep the number of doses at a minimum, and if possible to limit them to one per day.

In order to avoid these difficulties we believed that hetrazan could be more easily administered if it were prepared in a palatable liquid vehicle. A syrup of hetrazan, containing 30 mg. (dihydrogen citrate salt) per ml., was prepared. This syrup, which was cherry-flavoured, was very palatable, and when diluted with water was easily administered. It was then decided to compare the efficacy of different dosages of syrup of hetrazan with that of the 6 mg. per kg. given in tablet form. We also believed that larger single doses of the drug might be more effective than smaller divided doses and that these should be tried.

DOSAGE

Three groups of patients with ascariasis, their ages ranging from 3 to 70 years, were selected consecutively for treatment with syrup of hetrazan. In the first group of 43 patients, syrup of hetrazan, in doses containing 13 mg. per kg. body-weight, was administered once daily on each of three successive days; in the second group of 24 patients, a dose of syrup of hetrazan containing 13 mg. per kg. was administered on the first day, and doses of 20 mg. per kg. were given once daily on the second and third days; in the third group, 37 patients were given doses of syrup of hetrazan containing 13 mg. per kg. once daily on each of four successive days.

Specimens of fæces were examined by the S.A.E.X concentration technique, and the ova of helminths, including those of ascaris, were counted according to the method of Stoll (1923) before treatment with syrup of hetrazan was started, and again seven and fourteen days after treatment was completed.

RESULTS

In the first group of 43 patients, we calculated, on the basis of one pair of ascaris for each 2000 ova per gramme of fæces, that the worm burdens ranged from 2 to 182 ascarids. On the fourteenth day after completing treatment, it was found that the ascaris egg-counts had been reduced by 86% in the entire group of patients. In 17 of these patients no ascaris ova were found in samples of fæces obtained fourteen days after completing treatment. In 3 patients, after initial reductions in egg-counts by the seventh day after treatment, the ova returned to approximately their original pretreatment levels by the fourteenth day; 2 patients had reductions in egg-counts amounting to only 31% and 48%. In these cases the egg-counts were considerably reduced by the seventh day, but were increased by the fourteenth day. In the remaining 21 patients, the reductions in the egg-counts ranged from 50 to 98·5%.

In the second group of 24 patients, the worm burdens ranged from 2 to 260 ascarids. Fourteen days after

TABLE III—EFFECT ON EGG-COUNT OF SYRUP OF HETRAZAN 13 MG. PER KG. PER DAY FOR FOUR DAYS

Patient	Eggs per gramme			% reduction
	1st day	7th day	14th day	
51	59,400	4200	800	99
52	70,800	38,000	12,000	83
53	110,400	15,000	36,000	67
54	11,600	3200	4000	65
55	53,200	4600	2000	96
56	24,800	0	0	100
57	69,200	0	0	100
58	130,000	0	0	100
59	65,600	18,400	14,000	79
60	100,000	2800	5600	94
61	52,200	18,000	13,600	74
62	28,600	17,200	3200	89
63	1200	0	0	100
64	42,800	3000	2100	95
65	27,200	12,000	12,000	56
66	48,600	0	3600	93
67	7200	0	0	100
68	83,400	2400	0	100
69	1800	1800	800	56
70	13,000	3000	0	100
71	15,200	3600	0	100
72	31,000	0	0	100
73	36,800	0	0	100
74	7200	0	0	100
75	11,800	0	0	100
76	44,000	600	2400	94
77	5400	0	0	100
78	15,400	0	0	100
79	18,600	0	0	100
80	144,000	14,000	26,800*	81
81	136,000	6200	6200	95
82	32,000	0	0	100
83	50,000	0	0	100
84	17,000	0	0	100
85	36,000	0	0	100
86	54,000	0	0	100

* Half of the eggs counted were infertile.

completing treatment, the counts for ascaris eggs had been reduced by 95% in all the patients. In 16 patients the eggs of ascaris could not be found on the fourteenth day after completing treatment; 2 patients had reductions in egg-counts amounting to 67% and 69%, while the remaining 6 patients had reductions ranging from 87 to 98%.

In the third group of 37 patients, the worm burdens ranged from 2 to 144 ascarids. On the fourteenth day after completing treatment there was a 91% reduction in the number of ascaris ova in the entire group of patients; in 20 cases specimens of fæces were completely free from ascaris eggs fourteen days after completing treatment. In 1 patient the ascaris egg-counts were reduced by 56%, while in the remaining 16 patients the reductions ranged from 65 to 99%.

Although it was impossible under semi-field conditions to count the actual number of worms expelled we learned from the patients, who are well acquainted with the appearance of ascaris, that the worms began to be expelled on the second day of treatment, and that the largest numbers were expelled on the third and fourth days after starting treatment with either syrup of hetrazan or the hetrazan tablets. Those worms which we were able to examine were either stunned, dying, or dead. Some of the dead worms appeared to be partly disintegrated.

There were no significant changes in the egg-counts of hookworm, *Trichuris trichiura*, *Hymenolepis nana*, *H. diminuta*, *Tænia saginata*, or *T. solium*, or in infections with *Enterobius vermicularis* after treatment with syrup of hetrazan or hetrazan tablets.

Toxic Reactions

Only 1 patient, who received single daily doses of 13 mg. per kg. for four days had untoward reactions after taking syrup of hetrazan. This patient was suffering from severe destructive and deforming yaws. These reactions consisted of moderate vertigo, mild depression, and loss of appetite, but were not severe enough to warrant discontinuing treatment. As stated previously, though the patients who received 10 mg. per kg. of hetrazan in tablet form three times daily had toxic reactions severe enough to cause us to interrupt treatment, none of the patients who received doses of 6 mg. per kg. three times daily had reactions.

DISCUSSION

The results of treatment in these cases of ascariasis suggest that hetrazan (1-diethylcarbamyl-4-methyl piperazine dihydrogen citrate), when given in adequate doses, is an effective anhelminthic in human ascariasis. We believe that the reason why Ruiz-Reyes et al. (1950) obtained results that were only partially satisfactory was because the dose was insufficient.

Though hetrazan tablets administered in doses of 6 mg. per kg. per body-weight three times daily for five days expelled numbers of ascaris comparable to those removed by syrup of hetrazan given in single doses of 13 mg. per kg. body-weight on the first day and 20 mg. per kg. on the second and third days, or in single doses of 13 mg. per kg. body-weight for four days, we prefer to use syrup of hetrazan since it obviates multiple daily doses, and is easier to administer to small children.

The high anhelminthic activity of syrup of hetrazan when given in such single daily doses supports our original supposition that larger doses could be at least as effective as smaller doses administered three times daily, though the total daily dose might be the same. Actually on a total dose basis, considering that the hetrazan tablets were administered for five days, and the syrup of hetrazan for three or four days, the larger doses appear to be more effective.

Objections might be raised about the number of days over which treatment with hetrazan must be continued, and that for field treatment of ascariasis an anhelminthic effective in one dose is essential. Though oil of chenopodium and hexylresorcinol are sometimes quite effective when given in single doses, oil of chenopodium is toxic, especially in people in poor physical condition, while the hexylresorcinol is difficult to administer to young children, and unless the capsules are swallowed intact they may cause chemical burns of the buccal and œsophageal mucous membranes. In addition to these systemic and local toxic effects, both of these drugs require restricted diets or fasting and purgation, and these requirements complicate the use of "one dose" anhelminthics for the treatment of ascariasis. We are not aware of any anhelminthic which is uniformly effective in single doses, since oil of chenopodium and hexylresorcinol must in many cases be repeated to accomplish complete expulsion of the ascaris.

Although hexylresorcinol has enjoyed wide favour in the treatment of ascariasis, the cures claimed in published reports on this drug vary widely, from 30 to 90%. We have not obtained expulsion of many more than 80% of the ascaris in cases which we have treated with hexylresorcinol, and in which worm burdens were ascertained by Stoll egg-counts before and after treatment.

Another advantage possessed by hetrazan when administered in syrup or tablets in doses not exceeding 20 mg. per kg. per day is the almost complete lack of toxicity. This feature makes it a very suitable anhelminthic in those areas where ascaris burdens are heavy, where malnutrition is prevalent, and where people are suffering from the effects of the worms.

We did not find any instances of migration following the administration of hetrazan. In view of the fact that the ascaris which we were able to examine after treatment with hetrazan were stunned and dying, or were dead, it is unlikely that this drug will cause irritation or stimulation of these worms with resulting abnormal migration or "balling up."

We believe that syrup of hetrazan, because of its excellent anhelminthic efficiency (91–94% of the ascaris removed), its low toxicity (less than 1%), and its ease of administration, is the anhelminthic of choice for the treatment of human ascariasis and would be useful for mass treatment in eradication campaigns.

We wish to express our deep appreciation to Mr. Hodelin René for his excellent assistance in conducting this investigation. The hetrazan used was supplied by Dr. R. W. Linton, Lederle Laboratories Division, American Cyanamid Company.

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". . . the 'modern trend' in medical practice—a trend which sets tradition on one side and reduces the doctor to the status of a stilted pseudo-scientist, intent on disease as such and on its discovery by clinical examination, tests and other laboratory aids, and forgetful that the patient is a sick man or woman, with his or her own frets and foibles, aversions and raptures. . . . The origin of the fault, for fault it is, probably lies in the early and incorrect use of the word 'case.' When the embryo doctor says that his case is doing well after operation, he will probably deny with some vigour that he is taking from the patient some of his human attributes . . . but, unconsciously perhaps, he has identified the person with the disease and has set going a mechanism which may . . . help him to adopt what we have called the 'modern trend.'" —From a leading article entitled "The Patient is a Person," *Med. J. Aust.* Dec. 1, 1951.

SIMPLIFIED METHOD OF ESTIMATING FORMALDEHYDOGENIC CORTICOSTEROIDS IN URINE

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THERE is no need to urge the importance of a fairly rapid yet direct and reliable method of estimating urinary corticosteroids. The existing chemical and biological procedures are complicated and laborious.

At present there are two main chemical techniques in use: the first estimates reducing steroids, but the reaction is not a specific indicator of excretion of compounds E and F and can be very misleading; the other chemical method estimates formaldehydogenic steroids. Both 11-dehydro-17-hydroxycorticosterone (compound E) and 17-hydroxycorticosterone (compound F) contain a primary α-ketol group and hence, when treated with periodic acid, liberate formaldehyde. Although not entirely specific in urinary extracts, this reaction is taken to indicate the presence of these compounds, and the quantity of formaldehyde liberated provides a direct estimate of the amount of these compounds that is present (Daughaday et al. 1948).

An improved method utilising Daughaday's principle as well as important changes in the treatment of the urine before extraction is described here. The significant features of our procedure are as follows:

(1) *Preservation.*—The urine is collected into a bottle containing acetic acid and sodium sulphite. Bacterial growth is therefore inhibited, and the vulnerable α-ketol group is protected against oxidation.

(2) *Hydrolysis.*—Acid hydrolysis of the urine liberates corticosteroids from conjugation. This is usually done at room-temperature to minimise any destruction of the corticosteroids by the acid. Maximum hydrolysis with little destruction is achieved by acidifying the urine at 60°C in the presence of sulphite.

(3) *Estimation of Formaldehyde.*—With other methods the formaldehyde formed by treatment with periodic acid is removed from the reaction mixture for estimation. One method of removal is distillation, and another is slow absorption by the Conway method (Bassil and Hain 1950), which takes a very long time. By treating the solution directly with calculated quantities of silver sulphite and filtering off the silver iodide that is formed, separation of the formaldehyde is obviated and the solution is ready for colorimetric estimation. From a calibration curve* obtained from estimation of urinary extracts with added known quantities of cortisone it is easy to calculate the corticosteroid content of the specimen under investigation.

The above changes in technique also improve the recovery of corticosteroids; by using a magnetic stirrer and a specially ground joint glass tap devised by us, 80% has been recovered. We consider that by using urine formed during the night the possible variation of cortisone content due to any stress and activity during the daytime may be minimised. We have found in a small series that the coefficient of variation is less than in a twenty-four-hour specimen.

METHOD

The first morning specimen of urine is collected into a container which contains 300 mg. of sodium sulphite. Glacial acetic acid 3 ml. is immediately added, and the container is tightly corked. Under these conditions the urine may be kept for twenty-four hours before extraction is begun. A 50 ml. sample of the specimen is used for the assay.

Before extraction this sample is heated for fifteen minutes in a closed flask at 60°C with 0·12 ml. concentrated sulphuric acid and 60 mg. sodium sulphite. After this it is cooled to room-temperature, and its pH is adjusted with sodium hydroxide to between 6 and 7 (this requires 1·5–1·9 ml. of a 25% *w/v* Na OH solution).

The sample is next extracted three times with 7·5 ml. of chloroform by shaking in a separating funnel. The chloroform extracts are combined, and the emulsion is destroyed by centrifugation. The extract is then dried over Na_2SO_4, and the chloroform is removed under vacuum at 40°C.

The residue obtained by the procedure is dissolved in 1·5 ml. of benzene and transferred to a small separating funnel. Three further benzene washings, each of 0·5 ml., ensure that the entire residue is transferred.

The benzene is extracted four times with 5 ml. of distilled water, and the corticosteroids are recovered from the water with three chloroform extractions, each of 4 ml.

The combined chloroform extracts are evaporated to dryness under vacuum at 40°C, and the residue is used for the colorimetric estimation. To this residue are added 1 ml. of potassium-periodate solution and 0·5 ml. of 0·3*M* sulphuric acid, which is then left to stand for forty-five minutes. 0·5 ml. of sodium sulphite 4% *w/v* solution is then added, and the iodine contained in the oxidation mixture is precipitated as silver iodide by the addition of 0·5 ml. of silver sulphate solution 0·3% *w/v*. The 2·5 ml. of solution is filtered through a no. 4 sintered glass crucible, by means of which a clear and colourless filtrate is obtained. Of this filtrate 0·6 ml. is pipetted into a tube provided with a 2 ml. mark. 1 ml. of chromotropic acid solution is added, and the contents of the tube are thoroughly mixed. The open tube is then placed in a boiling water-bath for exactly thirty minutes. Care is taken that the contents of the tube are not exposed to light and that the steam from the water-bath is kept away from the mouth of the tube.

At the end of the thirty minutes the tube is removed from the water-bath and cooled, and the volume is made up to 2 ml. with 9*M* sulphuric acid. The contents are again thoroughly mixed by stirring with a glass rod, and the sample is then ready for colorimetric estimation.

A blank oxidation is performed each time a batch of extracts is assayed. Readings are taken with a photo-electric colorimeter using a green filter (maximal transmission at 550 mμ) and results are obtained from a previously constructed calibration curve.

A good deal of work has been done to check each step in this procedure and to ensure that really constant results have been obtained.

RESULTS

Estimations were done in normal persons and patients with rheumatic diseases. A series large enough to provide maximum and minimum values for cortisone excretion in adults and children has not yet been done. So far, for normal men the range obtained is 55–190 μg.

EXCRETION OF FORMALDEHYDOGENIC STEROIDS IN NIGHT URINE OF TWO NORMAL PERSONS (A AND B)

A	Volume (ml.)	Formaldehydogenic steroids (μg.)	B	Volume (ml.)	Formaldehydogenic steroids (μg.)
1	360	130	1	205	88
2	190	110	2	230	120
3	180	112	3	225	92
4	190	106	4	170	95
5	260	109	5	345	62
6	150	57	6	475	154
7	170	55	7	480	157
8	220	82	8	575	447*
9	265	127	9	640	201†
10	225	99	10	535	118
11	225	82			

* Immediately after 100 mg. cortisone acetate orally.
† First day after cortisone.

* The calibration curves will be given in a full paper to be published shortly. Meantime we will gladly give particulars to interested research-workers.

in a night urine, but for an individual the range is somewhat narrower. Two examples are given in the accompanying table.

An example of the effect of administration of 100 mg. of cortisone by mouth in a single dose before retiring is also given in the table.

It should be noticed that there is a very considerable variation in the volume of the night specimen, and that with small volumes there is a tendency to a smaller output of cortisone.

SUMMARY

An improved method for estimation of formaldehydogenic steroids in the urine is described.

A single estimation carried out by an experienced technician need not take longer than six or seven hours. In practice, four estimations can be done by one technician in eight or nine hours.

The range of excretion in the night urine of normal men, so far established by this method, is from 55 to 190 μg.; for an individual the variation is much less.

We are indebted to the Berex Pharmaceutical Company for the facilities that they provided which made this research possible. We wish to thank Merck Incorporated, Rahway, N.J., U.S.A., for a gift of cortisone supplied at a time when it was very scarce. We are grateful to Dr. Francis Bach, consultant of rheumatic diseases, Dr. F. A. Bryning, medical superintendent, Dr. L. Bernstock, of the pathological department, Hackney Hospital, and Dr. D. Stern, of Wooloston House Hospital, Newport, for their assistance, and to Dr. E. N. Allott and Prof. J. Yudkin for their interest and coöperation in this work.

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INFESTATION OF THE HUMAN BRAIN WITH CŒNURUS CEREBRALIS

REPORT OF A FOURTH CASE

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WE have previously reported (Becker and Jacobson 1951) three cases of human infestation with *Cœnurus cerebralis*, the larval form of the tapeworm *Multiceps multiceps*. In these cases the parasitic cysts were clearly of the cœnurus type—i.e., a single cyst contained numerous scolices arranged in groups. We found it impossible to evaginate these scolices and therefore did not obtain any evidence of the structure of the larval rostellum or hooklets. Since then we have investigated, in a fourth case, the structure of this parasite in the human brain.

CLINICAL RECORD

A European male, aged 28, was admitted to the department of neurosurgery, Johannesburg General Hospital, on May 31, 1951. He was born in the Rustenburg district in the Transvaal. Apart from four years in an infantry regiment during the second world war, he had always lived in this area, and for fifteen months before admission he worked as a miner on a chromium mine in the same area. He was brought up on a farm where there were no sheep but some dogs were kept. There are some sheep in the area, and many goats, monkeys, jackals, baboons, and vervets.

In September, 1950, he had been admitted to the Rustenburg Hospital with incessant vomiting and moderately severe headaches. He was thought to have a gastro-intestinal complaint, but investigation of the gastro-intestinal system failed to reveal any positive evidence of disease. He spent two weeks in this hospital and was discharged as recovered. He remained well until February, 1951, when he noticed he was unsteady on his legs with a distinct tendency to sway to the right. He noticed no clumsiness of his upper limbs. At the beginning of March, 1951, he complained of occasional episodes of double vision. Four weeks before admission he developed severe occipital headaches radiating down the back of his neck to his shoulders. Two weeks later he had severe attacks of vomiting.

Condition on Admission

On examination he was rather sallow, with some evidence of loss of weight. He had severe generalised headaches and some nuchal rigidity. His optic discs showed early papilloedema. There was some slow nystagmus when he moved his eyes to the left. He had slight ataxia of his left arm and leg, staggering to the left. He had a fine tremor of his outstretched fingers. Reflexes were brisk but in no other way abnormal. The remainder of the clinical examination was negative.

Investigation

On June 5 a ventricular catheter was inserted, and the lateral ventricles were found to be moderately enlarged. A specimen of the ventricular fluid contained 3 polymorphs per c.mm., 6 lymphocytes per c.mm., about 15 red cells per c.mm., and total protein 16 mg. per 100 ml. The Kolmer cardiolipin Wassermann test and Lange's colloidal gold test yielded negative results.

On June 8 pneumo-encephalography through the ventricular catheter showed no gross shifts or deformities, but the fourth ventricle appeared considerably dilated.

Operation

On June 13 the posterior fossa was explored. In the region of the right accessory nerve a large collection of closely packed cysts was removed. They measured 0·5–1·0 cm. in diameter. Numerous cysts were also removed from the anterior aspects of the medulla oblongata. A large cyst presented at the dilated foramen of Magendie. This cyst was gently removed, together with three further cysts which presented in its place.

Histological Report

The cysts had the structure of parasitic cysts closely resembling those of *Cœnurus cerebralis*, but no scolices were found.

Progress

After the operation the patient developed high pyrexia, but settled down satisfactorily in ten days. He was discharged on July 8 feeling well, but on July 12 he developed pains at the back of his neck, vomiting, and a swelling over the operation site. He was readmitted to the department of neurosurgery on July 19 with a tense swelling over the decompression site and some nuchal rigidity. The nasal margins of his optic discs were not well outlined, and the retinal veins were full.

Pneumo-encephalography

On July 19 a ventricular catheter was inserted. On July 25 pneumo-encephalography showed a uniformly dilated ventricular system considerably bigger than at the previous pneumo-encephalography. There being no clear-cut evidence of a block of the fourth ventricle, 'Myodil' 1 ml. was introduced through the intraventricular catheter. In the X-ray pictures the myodil was seen to be strung out from the aqueduct of Sylvius to the level of the foramen of Magendie, and multiple indentations of its column were present along the roof of the fourth ventricle.

Second Operation

On July 31 the old incision was reopened. No cysts were found in the same place as before, but when the left cerebellar hemisphere had been amputated and the fourth ventricle laid open along its whole length, numerous cysts were found in the fourth ventricle, together with a severe ependymitis with granulation tissue $^1/_8$ in. thick in the roof of the fourth ventricle. The aqueduct of Sylvius, which was partially stenosed, was recanalised, and a rubber catheter was introduced from the third ventricle to the level of the atlas. Torkildsen's operation was next done to prevent any further blocking by floating cysts which may not have been removed.

Progress

The patient's convalescence was stormy, with high pyrexia, rapid pulse, and severe shock for two weeks. He slowly improved and is now convalescing favourably.

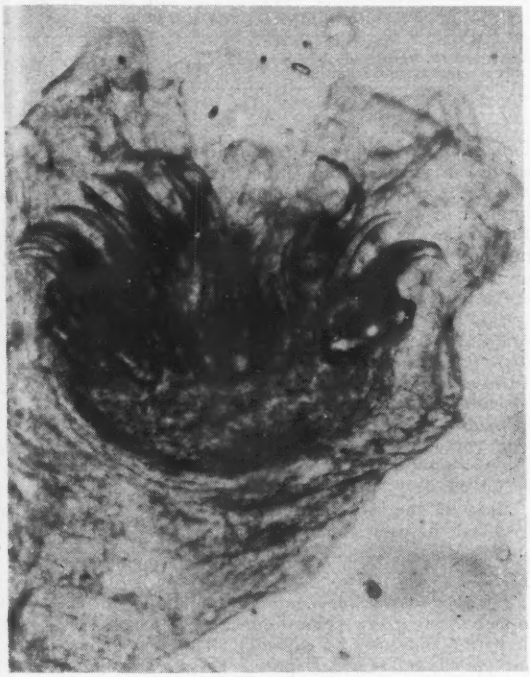

Fig. 1—Larval rostellum of *M. multiceps* showing two rows of hooklets. (×190.)

PATHOLOGY

The cysts removed from the fourth ventricle at the second operation averaged 1/4 in. in diameter. They had a cloudy-white appearance and were partially filled with fluid which, on aspiration, was turbid. This fluid was examined microscopically with negative results.

A cyst was opened on a microscope slide, and its inner aspect was examined. Numerous minute beaded areas were seen, and one of these was mounted firmly in glycerin jelly. Under low-power magnification numerous scolices were seen. Each scolex carried a rostellum armed with two rows of hooklets (fig. 1), and the neck had a curious wrinkled appearance and in some cases was thickly encrusted with calcific bodies. Average measurements were as follows:

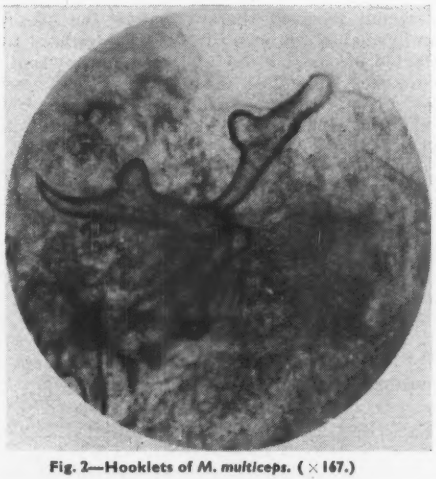

Fig. 2—Hooklets of *M. multiceps*. (×167.)

Rostellum, 200–250μ.
Number of hooklets, 24–32.
Size of large hooklets, 134–185μ.
Size of small hooklets, 70–110 μ (fig. 2).

The identification of this parasite as a cœnurus larva of multiceps genus is straightforward (see table), but species identification is not easy.

Several of the cysts were sterile. This we have observed before (Becker and Jacobson 1951); the human brain seems not to be an ideal site for the development of this parasite.

DISCUSSION

In our previous paper (Becker and Jacobson 1951) we drew attention to certain features which enable the diagnosis of cœnurus infestation to be made before operation. Here we further elucidate the pathology of the cysts. In our previous communication we emphasised the radiological appearances of the ventricular system, pointing out the great degree of dilatation that develops throughout the ventricular system when the parasite is situated in the structures occupying the posterior fossa. Arana Iniguez and Asenjo (1945), in a survey of their thirteen cases of cysticercosis of the posterior fossa, reported the almost constant occurrence of dilatation of the ventricular system, and at operation or at necropsy they found racemose clusters ("bunches of grapes") identical with the naked-eye appearance of our findings. They did not describe the histological structure of the cysts. Obrador (1948) reports a similar condition in his two cases of basilar cysticercosis but without describing the histology of the cysts. The syndromes and appearances described by these workers were identical with those found by us. In our series we have found the structure of the cysts to be that of cœnurus and not cysticercosis infestation. The naked-eye appearance of the cysts may suggest cysticercosis, but in all cases of the racemose or "bunches of grapes" type, situated especially in the posterior fossa, we always found evidence that the cysts were of the cœnurus type. We feel that in all cases of parasitic infestation in the posterior fossa, especially of the racemose type, cœnurus is the parasite responsible. We wish to emphasise the necessity for carefully examining the cysts histologically. Many of them are sterile, but some evidence of the parasite will be found, such as calcific bodies, immature or mature scolices, and occasionally hooklets.

SPECIFIC CHARACTERS OF MULTICEPS CYSTS (BAYLIS 1929)

Species	No. of hooklets	Length of large hooklets (μ)	Length of small hooklets (μ)
M. multiceps	22–32	150–170	90–130
M. serialis	26–32	135–175	78–120
M. gaigeri	28–32	160–180	115–150

The species of cœnurus has not been identified. This would only be possible after passing the mature larva through the intestinal system of the dog and reproducing the worm. Unfortunately the mature scolex with hooklets must be present in the larva for identification, and these mature scolices are rare. Nevertheless, no cœnurus other than *C. cerebralis* has been found infesting the brains of animals. *C. cerebralis* is the larva of *M. multiceps*. The larva of *M. serialis* and *M. gaigeri* are only found in muscle tissue in man, and we found no evidence of muscle infestation in our patients. Therefore it is reasonable to label the larva found in our cases *C. cerebralis*, the larval form of *M. multiceps*. We hope to feed dogs with a suitable larva at a later date and so reproduce the mature *M. multiceps* worm in the dogs' intestines.

SUMMARY

A fourth case is described of infestation of the human brain by *Cœnurus cerebralis*.

The detailed structure of the scolex and the hooklets is described.

To prevent confusion with cysticercosis it is necessary to examine the larva histologically.

We wish to thank Mr. R. A. Krynauw, head of the department of neurosurgery, Johannesburg General Hospital, for permission to investigate the present case; and to Mr. K. Allen and Dr. A. C. Watt, of the department of neurosurgery, for their helpful advice and criticisms.

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CONTROL OF PERTUSSIS IN DAY-NURSERY CONTACTS WITH CHLORAMPHENICOL

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THE promising preliminary results obtained with chloramphenicol in thirteen contacts of pertussis, in ten of whom the disease was arrested in the preparoxysmal stage (Bogdan 1951), suggested that this method would be a convenient and effective way of controlling institutional outbreaks (*Lancet* 1951). In such outbreaks, where a large proportion of the children are often exposed to infection, they form a group of susceptible contacts particularly suitable for suppressive chloramphenicol therapy. This report describes the results obtained with this method in a pertussis outbreak in a day-nursery.

TABLE I—PERTUSSIS SWAB RESULTS IN DAY-NURSERY CONTACTS

—		At start of outbreak	Three days later
Susceptible contacts	Positive	8	5
	Negative	8	9
Previously immunised contacts	Positive	Nil	Nil
	Negative	4	4
Children said to have had pertussis previously	Positive	Nil	Nil
	Negative	7	7
Total	..	27	25

TECHNIQUE OF INQUIRY

A child incubating the disease stayed one afternoon in the day-nursery. Next day he started to cough, and a fortnight later he whooped and attended the clinic. When it was known that his swabs were positive for *Hæmophilus pertussis*, an outbreak was anticipated. A mobile team from the Pertussis Contact Clinic swabbed all the children. Pernasal and postnasal swabs were taken from the 27 primary contacts, who were swabbed again three days later (table I). The first series of swabs from contacts in this outbreak showed that eight of the susceptible children had become infected, though five were still symptom-free. The second series of swabs yielded negative cultures in three children who had had positive swabs on the first occasion. Four children who had been immunised and seven children who gave a past history of pertussis had negative swabs on each occasion. Eight secondary sibling contacts of these day-nursery children were swabbed, and positive swabs were obtained from two, both of whom were still symptom-free. This made a total of seven contacts who gave positive swabs while still in the incubation period of whooping-cough a variable number of days before the onset of symptoms (table II). Further swabs were taken where reinfection or persistent infectivity was suspected. All the swabs were cultured on a special semisynthetic culture medium (Lacey 1951).

TABLE II—DIAGNOSIS OF PERTUSSIS IN CONTACTS BY SWAB-CULTURE DURING INCUBATION PERIOD

Day before onset of pre-paroxysmal stage	4th	3rd	2nd	1st	Total
No. of children	4	2	Nil	1	7

Contacts were divided into the following groups:

Group A: eleven susceptible contacts (nine with positive swab-cultures) allowed to remain in the day-nursery and start treatment with chloramphenicol.

Group B: seven contacts with a past history of pertussis, who also remained in the day-nursery.

Group C: nine remaining susceptible contacts, who were sent home, given lactose capsules, and followed up in the Contact Clinic. Three became infected, and two of these were then given chloramphenicol.

Most of the sibling contacts were followed up and swabbed, as well as two children who visited the day-nursery once.

DOSAGE

All the susceptible contacts remaining in the day-nursery were given chloramphenicol 125 mg. six-hourly (half the contents of a capsule). This was given for six days, at the end of which special cholesterol-coated tablets containing chloramphenicol 100 mg. were substituted and also given six-hourly (Grainger, personal communication). These tablets of chloramphenicol were found more satisfactory; they were more compact and obscured the bitter taste. Blood-chloramphenicol levels, estimated in five children aged $1^4/_{12}$—$4^2/_{12}$ yr. from $1^1/_2$ to 4 hours after taking these special tablets, ranged from 3·6 to 18 γ per ml., indicating good absorption of the drug (J. H. Wilkinson, personal communication). In the hope of preventing reinfection chloramphenicol was continued for 10–14 days, by which time all the contacts were known to have negative swabs.

CLINICAL RESULTS

Chloramphenicol was given to contacts at all stages of the disease, and the best results were obtained with early treatment. Two infected children received suppressive therapy in the incubation period while still symptom-free, and developed no illness. The disease was arrested at the preparoxysmal stage in eight others, all of whom received therapy before the 4th day of preparoxysmal symptoms. In one child whose therapy was started on the 4th day of the preparoxysmal stage, the paroxysms were not averted, though the illness never became severe. No great clinical benefit was obtained in 3 children where therapy was not begun until the paroxysmal stage.

Of the eight children whose illness had been arrested three became reinfected after an interval, having been symptom-free with negative swabs, no immunity resulting from arrest of the disease at this early stage. Two brothers received irregular and inadequate dosage, and,

TABLE III—RESULTS OBTAINED IN 14 CONTACTS

Swab result	No symptoms developed	Arrest at pre-paroxysmal stage	No modification	Total
Positive.. ..	2	6	3	11
Negative ..	Nil	2	1	3
Total	2	8	4	14

TABLE IV—ELIMINATION OF INFECTIVITY IN CONTACTS

Stage when chloramphenicol was begun	Further course of disease	Day of therapy after which swabs remained negative
Incubation period	No symptoms developed	3
		4
Early in preparoxysmal stage	Arrested	6
	,,	4
	,,	4
	,,	7
	,,	4
	,,	7
Paroxysmal stage	Not arrested	7
		9
		7

as a result, in one the disease was not arrested and the other relapsed. In ten of the fourteen treated contacts the disease was arrested (table III).

INFECTIVITY

Infectivity was confirmed by taking swabs at intervals of 2–4 days from all the children receiving treatment. The earlier chloramphenicol was given, the sooner swabs became negative and remained negative (table IV). With one exception infectivity was eliminated within a week of therapy.

This reduction in infectivity much curtailed the necessary periods of exclusion from the nursery. Normally L.C.C. day-nursery regulations require a child to stay away for 28 days once it has whooped. In an outbreak of pertussis in this day-nursery in 1948, when this regulation was observed, twelve children developed whooping-cough and stayed away on account of illness for an average period of 33·5 days; that outbreak extended over 89 days and came to an end during the long summer recess.

In the present outbreak four children did go on to whoop; but, therapy having eliminated their infectivity, their absence averaged only 11 days. The total number of child/days lost from whooping-cough by these children was 44, in contrast to 403 child/days in the previous outbreak (table V). This allowed the mothers to return

TABLE V—ABSENCES FROM DAY-NURSERY DUE TO PERTUSSIS

	Year of outbreak	
	1948	1950
Special measures	Nil	Chloramphenicol; swabbing of contacts
Children present in day-nursery at start of epidemic	29	27
Children who reached paroxysmal stage	12	4
Duration of epidemic	89 days	17 days
Total child/days lost	403	44
Average days lost per child in paroxysmal stage	33·5	11

to work earlier. No time was lost by the mothers of five of the eleven susceptible children who attended the day-nursery throughout, receiving suppressive therapy from the nursery staff by day and from their parents at night.

IMMUNISATION AND AGGLUTININS

Six of the children had been previously immunised. Two were brothers: one escaped infection; and the disease was only temporarily arrested in the other, because he became reinfected and whooped. In his case neither previous immunisation or recent modified illness had brought immunity.

One symptom-free contact, also previously immunised, had positive swabs and was given chloramphenicol; he continued to remain well, swabs becoming negative. Another previously immunised child, who received no chloramphenicol, had a two-day catarrhal illness and seems to have carried the infection home, because his brother developed pertussis.

Two children visited the day-nursery one afternoon. Both had been immunised in the U.S.A. The sister was immunised at the age of 5 weeks and subsequently reimmunised with a vaccine prepared in the U.K. She had a slide agglutinin titre of less than 1 in 5, and her illness progressed to the paroxysmal stage. Her brother with a slide agglutinin titre of 1 in 80, started to cough, but his disease was arrested by chloramphenicol.

Other than this last boy, all six previously immunised children had slide agglutinin titres of less than 1 in 5, as did all the remaining children, including those with a past history of pertussis. The titres of 8 children whose swabs had been positive were re-examined in the fourteenth week from the start of the outbreak. They had all been given chloramphenicol at various stages of the disease, including the incubation period. In every case the titre was less than 1 in 5, as was the titre of three children who had previously had pertussis and had been re-exposed to infection during this outbreak. From these few cases no definite relationship between slide agglutinins, clinical susceptibility, exposure, and immunity emerges.

The visit of the boy who seems to have started this outbreak while still incubating the disease, as well as the infection of the two children who came to the day-nursery while all the children were still symptom-free, suggests that infectivity in the incubation period is high.

One primary contact, a boy aged 9 months, had positive swabs. Though he had never been immunised he remained symptom-free without therapy, and swabs became negative. Four susceptible secondary contacts at his home escaped infection. This is the only example of a healthy temporary carrier of pertussis that I have met so far, though cases have been previously reported.

SUMMARY

The successful use of chloramphenicol in the treatment of susceptible contacts in a day-nursery outbreak of pertussis is described.

Early bacteriological diagnosis of infection, especially in the incubation period, proved invaluable to suppressive therapy.

Striking clinical results were obtained with chloramphenicol begun in the incubation period or early in the preparoxysmal stage.

The periods of exclusion from the day-nursery were greatly shortened by the rapid elimination of infectivity, greatly reducing the economic hardships arising from pertussis in the families concerned.

I wish to thank Dr. B. W. Lacey for his encouragement and all the bacteriological investigations; the matron and staff of the day-nursery, the superintendent, and health visitors of the City of Westminster Health Society for their coöperation; James Webber and Colin Markland for their assistance; Dr. Stanley White, of Messrs. Parke Davis, for chloramphenicol; the Hospital Medical Committee and Research Committee for their support; and especially Dr. Justin Clark for advice.

This work was completed with the aid of the Mary Scharlieb research studentship of the University of London.

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". . . Unfortunately the public tend to be more impressed by the luxury of the ambulance that brings them to hospital than by the clinical accuracy of the physicians or surgeons who treat them. More particularly is this so in retrospect, when, the illness fast improving, the attendant anxiety has abated. The tendency is, therefore, to spend more money on the material things such as ambulances—which can be readily appreciated by the uninformed laity—and less on the man who produces the diagnosis. . . ."—Editorial, *Lond. Hosp. Gaz.* October, 1951, p. 138.

Medical Societies

CENTRAL SOCIETY FOR CLINICAL RESEARCH

1951 MEETING IN CHICAGO

THE annual meetings of this society are intended for the investigators working in the area between Buffalo and Salt Lake City. This year's meeting was held in Chicago early in November.

ACTIONS OF ADRENOCORTICAL STEROIDS

Dr. JEROME W. CONN (Ann Arbor, Michigan) had been studying the metabolic effects of compound F (17-hydroxycorticosterone) and its acetate when given by mouth or by injection. Administered intramuscularly free compound F produced intense metabolic changes in all elements of the spectrum studied, whereas compound F acetate had much milder effects. On the other hand, when either the free compound or the acetate was given by mouth it produced severe metabolic changes comparable to those resulting from free compound F given intramuscularly. The intensity and diversity of the metabolic changes induced by this single steroid strongly suggest that compound F is the hormone secreted in excess by the normal human adrenal when it is stimulated by exogenous A.C.T.H. This agrees with the previous observations made in animals by Pincus.

Dr. STEFAN S. FAJANS (Ann Arbor) compared the effects of intramuscular and oral administration of compounds B, E acetate, F, F acetate, and S acetate (Reichstein) on the urinary excretion of 17-ketosteroids and formaldehydogenic steroids. When given compound S acetate by mouth in the same dosage, a patient with Addison's disease showed a much greater rise in excretion of 17-ketosteroids than another patient with atrophic cirrhosis of the liver. Since these steroids, when given by mouth, pass through the liver in high concentration, the findings suggest that the liver plays an important part in conversion of adrenal steroids to 17-ketosteroids.

Dr. WILLIAM ROBINSON (Ann Arbor) had studied the effects of A.C.T.H. and cortisone given systemically, and of intra-articularly administered cortisone and compound F on the joint fluid in rheumatoid arthritis. During systemic administration of A.C.T.H. and cortisone there was a prompt decrease in total white cells, due entirely to a fall in polymorphs, and evidence of improvement in quality of the joint mucin. Repeated daily intra-articular injections of 10–25 mg. of cortisone acetate produced a similar change in joint fluid cytology and improvement in quality and viscosity of mucin; these changes occurred chiefly in the treated joints, and were not seen to the same degree in affected contralateral joints. Joint-fluid viscosity depends primarily on the concentration and physical characteristics of hyaluronic acid. Increased viscosity is attributable to a rise in concentration or in degree of polymerisation of this muco-polysaccharide. Robinson's results support the concept that adrenocortical steroids benefit rheumatoid arthritis by a direct action at the connective-tissue level, and that, besides suppressing inflammatory changes, they help to make the altered chemistry of connective tissue more normal.

BLOOD-FLOW THROUGH COLLAPSED LUNG

Dr. RICHARD V. EBERT (Minneapolis, Minn.) discussed the measurement of blood-flow through non-ventilated portions of normal and diseased lungs. In a physiological sense, the circulation through non-ventilated lung represents an arteriovenous shunt, and in sixteen patients undergoing collapse therapy for tuberculosis this shunt accounted for only 4·6% of the total flow even though the oxygen uptake of the involved lung, as demonstrated by bronchospirometry, was reduced. In patients with advanced bilateral tuberculosis the figure was 3·6%; in bronchogenic carcinoma 7·1%; in convalescents from pneumonia 7·5%; in pleural effusion 8·3%; in pulmonary emphysema 5·1%; and in hepatic cirrhosis 5·8%. Thus the pulmonary shunt can be extremely small even in chronic pulmonary diseases with obvious destruction of function in large areas of lung.

ATHEROMA

Dr. SILAS M. EVANS (Milwaukee, Wis.) had produced in vitro phenomena resembling the early lesions of atherosclerosis. Blood samples from normal young adults and from cases of myocardial infarction or diabetes with vascular disease were pulsated 80 times a minute in an ingenious machine against strips of fresh normal aorta from cadavers for 72 hours at pressures from 300 to 0 mm. Hg. At the end of each experiment, the aortic strips were fixed, and frozen sections were stained for fat and examined under normal and polarised light. Deposits of birefringent particulate material were found in the wall of 75% of the aortic strips pulsated with blood from patients with cardiovascular disease, but only 4·5% of the strips pulsated with healthy blood had any deposits and they were very slight. The aortic strips in the "positive" group closely resembled similar preparations from early cases of atheroma.

CYANIDE POISONING

Dr. K. K. CHEN (Indianapolis, Ind.) had developed a new treatment for cyanide poisoning with sodium nitrate and sodium thiosulphate, injected intravenously, one after the other. The former is intended to produce methæmoglobin which will remove cyanide ions from tissues by the formation of cyamethæmoglobin; and the sodium thiosulphate converts the remaining cyanide to thiocyanate in the presence of rhodanese. Excellent results were reported in 29 cases, indicating that the method is effective in reviving people poisoned with hydrocyanic acid, potassium cyanide, or calcium cyanide, even after respiration has stopped.

VECTORCARDIOGRAPHY

Dr. J. A. ABILDSKOV (New Orleans) reported some studies of the spatial vectorcardiogram in normal young men. For correlating the findings with electrocardiography, simultaneous standard and unipolar leads were obtained, and high-speed cinematography, models, and radiology were also used in comparing the value of various techniques. The equilateral tetrahedron, a spatial extension of the equilateral triangle, is a simple and accurate reference system for recording extensive electrocardiographic findings, but in their present form spatial vectorcardiograms will not define the various electrocardiographic leads in detail. In this study they never revealed any fact of clinical importance not indicated by electrocardiography. Moreover, the vectorcardiogram does not reveal temporal phenomena such as the duration of intervals and the cardiac rhythm.

DISTRIBUTION OF RADIO-ISOTOPES IN HEART-FAILURE

Dr. G. E. BURCH (New Orleans) had estimated the time needed for equilibrium in the distribution of long-life radiochlorine and radiosodium in men with and without chronic congestive heart-failure. C^{136} reached equilibrium of distribution in 36–60 hours in the controls, and in 60–120 hours in the patients with congestive failure. Na^{22} reached equilibrium in 36–60 hours. The specific activity of the urine was not found to be an index of the time of distribution. The dietary intake of chloride and sodium affected the equilibrium of distribution and measurable space—for example, with a low C^{135} intake, some compartments exchange less readily and equilibrate more slowly than when the intake is high. Considerable variations in the serum concentration with changing compartment size make it difficult to estimate the time of equilibration in congestive failure, and distribution may never attain equilibrium because of the large compartments with turnover slower than excretion. Burch believes that when measuring chloride or sodium space or total mass by means of tracers, at least 3 days should be allowed for equilibrium of distribution and for greater accuracy 5 days.

CONGENITAL PORPHYRIA

Dr. RUDI SCHMID (Basle, Switzerland), working with Dr. C. J. Watson, had demonstrated by tracer techniques that porphyrin synthesis in congenital photosensitive porphyria is fundamentally related to hæmoglobin formation (porphyria erythropoietica). However, in the acute intermittent and mixed types, where the bone-

marrow was normal, abnormal porphyrin formation occurs in the liver (porphyria hepatica). In their view the presence or absence of photosensitivity depends on the ratio of circulating preformed uroporphyrin to its colourless precursor.

PYRIDOXINE AND SEBORRHŒIC DERMATITIS

Dr. RICHARD VILTER (Cincinnati, Ohio) had already reported that desoxypyridoxine, a pyridoxine antagonist, produced a dermatitis clinically and histologically indistinguishable from seborrhœic dermatitis. The lesion responds specifically to pyridoxine, and is a sign of pyridoxine deprivation. Tests showed that pyridoxine applied in ointment form (10 mg. per g.) was absorbed and utilised by the skin and would relieve desoxypyridoxine-induced seborrhœa at the site of application in 72 hours. Patients with *spontaneous* seborrhœic dermatitis of the "sicca" type were then treated with various "vitamin" ointments. When desoxypyridoxine ointment (100 mg. per g.) was applied to mild seborrhœa, the lesions were intensified after 7 days' treatment. Local application of pyridoxine ointment cleared up these intensified lesions in a week, but pyridoxine administered parenterally had no effect. Thereafter, 9 patients with spontaneous seborrhœic dermatitis were treated with the ointment 'Vani-base,' for 2–3 weeks as controls, without improvement. Pyridoxine, 10 mg. per g. in vani-base, was then applied to one affected area on each patient, and a symmetrically placed affected area was treated as an additional control with the base alone. The areas treated with pyridoxine ointment cleared in 5–21 days, and the control areas remained unchanged. When local therapy was stopped, the seborrhœa reappeared in 2–3 weeks. Vilter concludes that the skin can convert pyridoxine in situ to a metabolically active substance. He suggests that one type of seborrhœa is due to a metabolic defect in the skin, which increases the local requirements for pyridoxine. His observations present a concept of disease due to a local, probably conditioned, deficiency state.

HYPERTENSION

Dr. G. E. WAKERLIN (University of Illinois) had found that a crude extract of hog's renal cortex, containing renin, protected dogs against experimental malignant renal hypertension. The extract was also highly effective in preventing arteriolonecrotic lesions and death. Semi-purified renin from hog's whole kidney did not protect against hypertension, arteriolonecrosis, and death. The protection against these factors was not closely correlated with the antirenin titre produced by semipurified renin from hog's whole kidney. Crude extract of hog's whole kidney had no antihypertensive effect. The antihypertensive activity of the renal cortex was related to antirenin in the absence of medullary protein. Wakerlin suggests from his findings that the non-renin fraction of crude renal-cortical extract is protective against arteriolonecrosis and death, but only if medullary protein is absent.

AFTER-EFFECTS OF RADIUM

Dr. AUSTIN M. BRUES (Chicago, Ill.) had followed the after-history of patients injected with radium chloride for 21 years. Three of them had a few of the circumscribed areas of bony necrosis that have been described. However, most of the patients showed minor, hitherto undescribed, lesions in the cortex of their long bones, which he believes are also characteristic of ionising radiation delivered to bone in situ by deposited radio-elements. Apart from these skeletal changes, there were no clinical or hæmatological findings likely to be related to the radium injections.

INTRAPERITONEAL BLOOD

Dr. ROBERT C. HARDIN (Iowa City) had injected blood into the peritoneal cavity through the posterior vaginal fornix of women patients who were to have abdominal operations later. From studies of the blood found at operation it was concluded that erythrocytes injected intraperitoneally did not appear in the peripheral circulation in significant numbers. The injected blood was slowly hæmolysed and slowly absorbed.

FRUCTOSE METABOLISM

The demonstration by Cori that insulin influences the phosphorylation of glucose, and that separate hexokinases for glucose and fructose exist in liver and muscle, raises the possibility that diabetics might utilise fructose better than glucose.

Dr. MAX MILLER (Cleveland, Ohio) compared the metabolic effects of intravenous fructose and glucose in normal and diabetic subjects. In normal people fructose produced a much greater rise in blood pyruvate, and a rise rather than a fall in plasma citrate. Fructose disappeared more rapidly from the blood-stream during the period of infusion. Under 10% of both fructose and glucose appeared in the urine. In diabetics, in the absence of insulin, fructose produced the same rise in pyruvate as in normal subjects, while glucose produced a slight or delayed rise. The increase in plasma citrate after fructose was similar in diabetics and in normal people. The blood disappearance curve of fructose and the amount of fructose excreted in the urine in diabetics were also the same as in normal subjects. Fructose invariably produced a fall in serum inorganic phosphorus, whereas there was usually no fall after glucose. The increase in blood glucose after fructose injection was higher in diabetics than in normal people. Miller believes that the metabolism of fructose differs from that of glucose in both normal people and diabetics, and that diabetics, even when not taking insulin, metabolise fructose in the same way as normal people. His observations were consistent with the theory that the phosphorylation of glucose to glucose-6-phosphate is impaired in diabetes, but that the phosphorylation of fructose, which is unaffected by insulin, proceeds normally.

Dr. ALBERT I. MENDELOFF (St. Louis, Mo.) had made studies by hepatic-vein catheterisation on 4 healthy men receiving intravenous infusions of 10% fructose. His results demonstrated very prettily that the splanchnic bed constantly removes 40–45% of the total fructose reaching it per unit time. Moreover, the back diffusion of fructose which is constantly noted in the peripheral circulation did not occur in the splanchnic bed. During infusion the blood level of lactic acid in the hepatic vein rose about 25%, and the pyruvic-acid level about 80%, whereas there was a fall of about 20% in diphosphopyridine nucleotide. This confirms and adds to Miller's observations.

STUDIES ON HYPERSENSITIVITY

Dr. LEWIS THOMAS (Minneapolis, Minn.) had continued his observations on experimental hypersensitivity. Rabbits were treated with 12 mg. of cortisone daily for four days and injected intracutaneously with streptococci on the third day. Cortisone was discontinued on the fourth day because longer treatment consistently led to fatal infections. At varying intervals after the streptococcal infection, a sublethal dose of Shear's *S. marcescens* toxin was given intravenously to provoke the Shwartzman skin reaction. Almost all the rabbits died within five days after the injection of toxin. At autopsy, petechial and confluent hæmorrhages were visible on the surface of the heart and throughout the myocardium. Microscopically, hæmorrhage, necrosis, and extensive pancarditis were observed in all the rabbits. The resemblance, both macroscopical and microscopical, between these lesions and those of acute rheumatic carditis in human beings was striking.

In a second report Dr. Thomas produced a generalised Shwartzman reaction, characterised by bilateral hæmorrhagic renal necrosis, in 75–100% of rabbits given two intravenous injections of Shear's toxin twenty-four hours apart. Nitrogen mustard, in dosages of 1·5–1·75 mg. per kg. of body-weight, completely prevented the reaction in all rabbits given it seventy-two hours before the initial injection of endotoxin. In addition, HN_2 regularly prevented the renal necrosis produced by a single injection of bacterial endotoxin in cortisone-treated rabbits, but only when given in dosages similar to those required for inhibiting the Shwartzman phenomenon. Thomas therefore believes that bilateral renal necrosis in cortisone-treated rabbits given a single

injection of bacterial endotoxin is similar in pathogenesis to the generalised Shwartzman reaction.

DEFICIENCIES PRODUCED BY INTRAVENOUS FLUIDS

Dr. ROBERT FRASER (Minneapolis) reported examples of magnesium, potassium, phosphorus, chloride, and vitamin deficiency resulting from the prolonged use of parenteral fluids. One patient developed fibrillary twitchings, gross muscle tremors, and choreiform movements of the extremities, jaw, tongue, and facial muscles, and was unable to talk or eat. At this time magnesium deficiency was recognised (serum magnesium, 1·19 m.eq. per litre). Magnesium sulphate was given intramuscularly; whereupon her choreiform movements and twitchings diminished dramatically and finally ceased; she could speak clearly again and began eating, and her serum-magnesium level returned to normal.

TESTING ADRENAL AND PITUITARY FUNCTION

Dr. ROBERT M. KARK and his colleagues (University of Illinois) had evaluated the clinical usefulness of the four-hour eosinophil response to corticotropin (Thorn test), epinephrine, and ephedrine in assessing adrenal, pituitary, and hypothalamic function in man and for diagnosing Addison's disease or hypopituitarism. From observations on 284 patients repeatedly tested with these agents and with placebos they concluded that: (*a*) single tests with corticotropin, epinephrine, or ephedrine which fail to show a significant eosinopenia do not establish the diagnosis of Addison's disease; (*b*) well-marked eosinopenia with these tests indicates adequate adrenocortical function if the initial count is high enough to rule out intrinsic errors; (*c*) repeated lack of response to ephedrine or epinephrine cannot be construed as indicating organic disease of the adrenal, pituitary, or hypothalamus; (*d*) repeated failure of corticotropin to produce significant eosinopenia is strong evidence of non-functioning adrenals; and (*e*) the level of response to epinephrine or ephedrine does not appear to be an accurate index of pituitary-adrenal function.

STORAGE OF BLOOD IN PLASTIC BAGS

(*Read by title only*)

Dr. R. O. MUETHER (St. Louis, Mo.) has found that blood which has been stored in plastic bags for 21 days causes no untoward reactions and is entirely satisfactory for transfusion. Similar changes occur in blood stored in plastic bags and in glass, though with the plastic bags the changes are somewhat slower.

R. M. K.

Reviews of Books

Selective Toxicity with special reference to Chemotherapy

ADRIEN ALBERT, D.SC., PH.D., F.R.I.C., professor of medical chemistry in the Australian National University; honorary lecturer in the department of biochemistry, University College, London. London: Methuen. 1951. Pp. 228. 7*s.* 6*d.*

CHEMOTHERAPEUTICALS, weed-killers, noxious agents used as weapons of war, insecticides, rodenticides, pharmaceuticals, and tumour-inhibiting agents: when the subject of selectively toxic agents is reviewed quickly, the practical achievements seem immense. All are discussed in this book, which derives from lectures given at University College, London, in 1949, and which is now in the form of a series of essays.

The subject is one which can be presented with emphasis on the active substances, or with emphasis on the organisms or organs acted upon. The author's choice is largely in terms of substances. An early chapter discusses biological principles of selective toxicity, and brief indications of biological aspects also appear with the individual agents. But the main subject-matter is arranged according to the type of combination between the selective agent and the biological component. Thus the acridine antiseptics, to which Professor Albert has contributed so much, are discussed in a chapter on salt-like links. Arsenicals are discussed with other substances forming covalent bonds in vivo. Sulphonamides are discussed with agents which appear to form enzyme-substrate types of linkage. Narcotics are included with chemically inert substances which probably act without forming any of these links.

A brief history of chemotherapy and observations on pharmacology form chapters which give a necessary counterbalance to the more systematic sections. Most of the chapters can be enjoyed as isolated essays of considerable scientific merit. Especially valuable is the accurate information in formulæ and tables, and the author's thorough practical grasp of the chemical aspects of his subject. The price makes the book magnificent value, and it could usefully be read by every person concerned with administering chemical substances to any form of life, if only so that he may learn how much has been achieved in specialties chemically cognate to his own.

Enzymes and Enzyme Systems

Their State in Nature. Editor: JOHN T. EDSALL. Cambridge, Massachusetts: Harvard University Press. London: Oxford University Press. 1951. Pp. 146. 18*s.*

THE Harvard University Laboratory of Physical Chemistry Related to Medicine and Public Health arranged the symposium of which certain lectures are reproduced in this book. Other aspects of proteins will be considered in successive memoirs from this laboratory. The enzymes referred to here are those of the mitochondrial oxidase systems (A. L. Lehninger and D. E. Green), peptidases and peroxidases (E. L. Smith, A. C. Maehly, and Britton Chance), and the proteins and protein enzymes of blood and liver in their natural state (E. J. Cohn and collaborators). Within their deliberately restricted and specialised fields, all these contributions, which include new material from the authors' laboratories, are of high quality.

Textbook of General Physiology

HUGH DAVSON, D.SC., scientific staff, Medical Research Council; honorary research associate, University College, London. London: J. & A. Churchill. 1951. Pp. 659. 45*s.*

IT is no easy task to write a book on general physiology, and it was particularly testing to follow in the steps of the late Sir William Bayliss. If the present book lacks the charm of style of the older one, nevertheless it is well and clearly written, and commendably up to date. Space is wisely saved by avoiding a synopsis of the principles of physical chemistry, but there are useful descriptions of some modern methods of investigation, such as the electron and polarising microscopes and X-ray diffraction apparatus. Few people have opportunity to use these types of apparatus, or even to see them; the general principles outlined here should enable readers to grasp more clearly the value of the results obtained by their use. The book ranges over the transport of energy in living systems and the transport of water and solutes. The latter section, particularly, gives an interesting account of red-cell and capillary permeability, of intestinal absorption, and of the secretion of gastric acid. There are shorter sections on muscle and nerve, and a good discussion of light and its effect on, and emission by, the organism. Workers in all biological fields should be grateful to Dr. Davson for collecting so much diverse information and presenting it intelligibly. The graphs and figures are, with few exceptions, well chosen and reproduced, and the list of references is ample without being discouragingly long.

Cooking for the Sick and Convalescent (London: Faber & Faber. 1951. Pp. 431. 27*s.* 6*d.*).—This textbook of dietetics for those who have to feed an invalid or some member of their family who is on a diet is just what might be expected from such a pair of experts as Prof. V. H. Mottram and Nell Heaton. The first two parts deal ably, accurately, and gaily with practical dietetics and dietary treatment in specific diseases, the third part with cooking for the sick and convalescent. The book is written for laywomen; but many a doctor, if he can keep it out of his wife's hands, will find it gives him just the sort of facts he needs to enlighten and encourage a harassed and not very bright mother of a family faced with the task of dieting an allergic child, a gouty parent, or an internally ulcerated husband.

THE LANCET

LONDON : SATURDAY, DEC. 29, 1951

Gamma-globulin

THE already considerable value of blood as a therapeutic and prophylactic agent was greatly enhanced by the work of COHN and others, who fractionated certain of its constituents. In particular, a concentrated globulin fraction—gamma-globulin—has been shown in well-controlled trials to provide safe and efficient protection against measles [1 2 3] and infectious hepatitis.[4 5] Gamma-globulin prepared from convalescent serum may confer immunity against a far wider range of diseases ; there is evidence of its potential value against rubella [6] and poliomyelitis.[7] Such immunity was thought to be passive and short-lived ; and in consequence it has been used almost entirely for young and weakly children, pregnant women, and others at special risk who require protection for a short time.

An investigation by STOKES and his colleagues [8] suggests that this assumption may not have been wholly justified. Their findings confirm the power of gamma-globulin to prevent infectious hepatitis in much lower dosage than is thought necessary for measles. The trials, which took place in a mental colony, a hospital, and a children's home, showed the power of gamma-globulin to halt those long-continued epidemics of infectious hepatitis which are occasionally troublesome in such institutions. More exciting, because of its wide implications, is their observation that the immunity of the inoculated was still present when they were deliberately or fortuitously exposed to infectious hepatitis nearly a year later. One can only speculate on the possible explanation. Very little immune globulin may be necessary to protect against hepatitis, and enough may still have been present when the subjects were subsequently challenged. It is possible that the gamma-globulin contained living hepatitis virus, and that the simultaneous injection of infective agent and antibody immunised the recipients without producing clinical disease. STOKES and his associates suggest that exposure to naturally occurring virus superimposed on a waning passive immunity resulted in inapparent infection and active immunisation. Many clinical cases occurred in the unprotected groups, and virus must therefore have been abundantly present in the communities concerned. Indeed, without these unprotected individuals the phenomenon might not have been observed. Many years ago HERRMAN [9] exposed babies in the first six months of life to measles. Many developed mild or subclinical infections, and the majority of these remained immune to measles when exposed years later. In the early days of yellow-fever immunisation effective protection was provided by almost simultaneous injections of attenuated virus and immune serum. Veterinarians have long used similar procedures to protect animals against rinderpest, distemper, and hog cholera. An encouraging report comes from BODIAN,[10] who has produced in monkeys active immunity against poliomyelitis by intramuscular injections of gamma-globulin and active living virus. The virus was injected into one calf and the globulin into the other ; the dosage of gamma-globulin was very large. He made the equally important observation that the injection of a neutralised mixture of virus and an immune globulin evoked no antibody response.

Fascinating possibilities now present themselves. Gamma-globulin is still regrettably scarce in this country, but Nature happily endows the majority of us at birth with enough maternal antibodies to last about six months. Perhaps more use could be made of these safe and inexpensive "inoculations," and of infective agents as they exist unmodified in Nature. If we could learn to assay resistance in terms of specific antibody, and to determine accurately the dosage of pathogenic organisms, host and parasite might be brought together at a time satisfactory to the interests of them both. Until a pathogen can be wholly eradicated it would seem hard to improve on so satisfactory an adjustment of the host-parasite relationship. Unfortunately we have little factual evidence, bacteriological or epidemiological, concerning that most desirable of all disease entities—the inapparent or subclinical infection. Every day babies and young children are successfully protected by maternal antibodies or gamma-globulin against family contacts with measles and other infections. How do they fare when exposed to the same infections in later life ? It should be possible to find the answer to this important question.

A report [11] from the U.S.A. provides reason of a different kind for the careful follow-up of recipients of all blood products. It describes an epidemic of serum hepatitis in surgical patients who had received human thrombin for the control of hæmorrhage. Until the virus of serum hepatitis can be detected without recourse to human volunteers, blood and all its products will carry a risk of this dangerous disease. Even gamma-globulin, though probably safe, cannot be above suspicion without more extensive follow-up studies.[12] This problem may eventually be solved by irradiation with ultraviolet light.[13] This method, however, is not fool-proof, and a false sense of security may be engendered ; hepatitis has been reported in recipients of irradiated plasma.[14 15 16]

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Cortisone in Rheumatic Fever

OPINIONS on the value of cortisone acetate and A.C.T.H. in the treatment of acute rheumatic fever have differed widely. MASSELL[1] declared that "preliminary observations with these substances have been so impressive that A.C.T.H. and cortisone hold considerable promise of being the long-sought-for remedy in rheumatic fever"; whereas CECIL is reported[2] as saying that these two substances were only "glorified aspirin" and that he had given up using them in this disease. Even the most enthusiastic quickly realised that these hormones do not "cure" rheumatic fever in the way that pneumococcal pneumonia is cured by penicillin. The symptoms of rheumatic fever—like those of rheumatoid arthritis—are suppressed, but the underlying disease persists. Unlike rheumatoid arthritis, however, rheumatic fever is a self-limiting disease, attacks of which usually last for six to nine weeks. Those who administer cortisone[3–7] hope that it will avert tissue changes in the heart-valves together with the more obvious signs of this disease.

Most workers agree with HENCH that the symptoms of rheumatic fever could be wholly suppressed by giving this hormone throughout the natural duration of the disease. Commonly relapse has followed the termination of treatment; but it is thought that in these cases administration was not continued long enough. (Another explanation of such relapses is that they represent an inevitable rheumatic reaction whose appearance has been delayed by cortisone in the same way that wound-healing may be delayed[8]; but if this were so all cases should relapse on withdrawal of treatment.) Fever almost always responds within three days; and relief of malaise is equally rapid. The pain, heat, and redness of arthritis also go within a few days; but joint swelling and synovial effusions take a little longer. Erythrocyte-sedimentation rates fall, usually reaching normal within a fortnight. Subcutaneous nodules are largely uninfluenced if they were present before the start of treatment. It would be interesting to know how commonly, if ever, fresh nodules appear during effective cortisone therapy. Both the rheumatic rash—erythema marginatum—and chorea may persist despite adequate treatment.[7 9] More importance should be attached to the persistence of a rheumatic manifestation, despite treatment, than to its apparent cure; for nearly all the manifestations of acute rheumatism may disappear spontaneously at any time.

The carditis of acute rheumatic fever is also thought to respond to cortisone. Experimentally RICH[10] has found that in rabbits with serum-myocarditis—which resembles rheumatic carditis—pathological changes could be inhibited by cortisone. The clinical evidence, however, is not so clear-cut. Sleeping tachycardia is often, but not always, lessened, and the slowing may outstrip any coincident fall in temperature. Precordial pain from pericarditis is usually rapidly relieved; but there have been failures despite adequate dosage, and pericardial friction has occasionally first appeared during treatment.[7] Sometimes cardiac enlargement, judged radiologically, rapidly disappears,[3] but exceptionally the heart shadow has enlarged.[4] Of the electrocardiographic changes of carditis prolongation of the P–R interval is quickly dispelled,[11] and electrocardiographic changes of pericarditis are also favourably influenced. Nevertheless in at least one case abnormal electrocardiographic changes first appeared during cortisone therapy.[4] The immediate valvular lesions of acute rheumatic carditis are mitral and aortic incompetence rather than stenosis; and in some cases not treated by cortisone the mitral systolic and aortic diastolic murmurs indicative of these lesions disappear spontaneously during convalescence.[12] MASSELL[1] believes that this proportion is increased by cortisone therapy. Cardiac failure complicating acute rheumatic carditis can result from myocarditis or valvular deformities, or both. Cortisone seems to relieve acute myocarditis but does not, of course, influence residual valvular deformities from previous attacks. Furthermore, the side-effects of cortisone administration include water and salt retention and œdema, which embarrass a failing heart. Pre-existing cardiac failure is temporarily worsened by cortisone, which in some cases has actually precipitated failure. Luckily this usually responds to mercurial diuretics, salt restriction, and—where valvular deformities play a part—digitalis. Only occasionally has it been necessary to reduce or interrupt cortisone therapy.

Other toxic reactions to cortisone have included "moon-face," striæ distensæ, and acne; these, though common, are not severe unless treatment is prolonged. Wound-healing may be delayed.[13] Serious complications due to decreased resistance to infection have not yet been reported; but the danger of converting rheumatic endocarditis to bacterial endocarditis must be remembered, and probably antibiotics should be administered along with cortisone.

There is as yet no evidence that the immediate mortality of rheumatic fever is reduced by treatment; in fact, in one case where the patient died the heart showed rheumatic changes unaffected by cortisone.[14] There is, indeed, no "watertight" evidence that this hormone is better than salicylates. There is also little evidence as to what sort of rheumatic fever is most likely to respond. On this point KINSELL,[15] summarising American experience, says: "Therapeutic response of patients with rheumatic fever of long standing is much less favourable." The same is true of salicylates; and it surely amounts only to saying that the worst cases do worst. Cortisone is, however, valuable in the acute phase, when its action is similar to that of the salicylates but somewhat more powerful. Owing to its toxic effects it should be given only in hospital.

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2. Cecil, R. L. Quoted by N. M. Gutteridge, *Lancet*, July 7, 1951, p. 31.
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13. Barrow, J. G., Sykes, C. R. *Ibid*, 1951, **147**, 41. See *Lancet*, Oct. 20, 1951, p. 724.
14. Spain, B. M., Roth, D. *Amer. J. Med.* 1951, **11**, 128.
15. Kinsell, L. W. *Ann. intern. Med.* 1951, **35**, 615.

Turning to long-term results, we again find no certain evidence that successful treatment of rheumatic fever will reduce the risk of chronic rheumatic valvular heart-disease. Acute rheumatism is usually followed sooner or later by permanent valve damage, and it might thus seem that suppression of the former might prevent the latter. But if this were so one would expect some correlation between the incidence and severity of the two conditions, and such a correlation is not evident.[16]

Physicians often come across adults with rheumatic heart-disease who admit to no antecedent history of acute rheumatism, and others with severely damaged hearts whose only rheumatic history is of vague limb pains. The proportion of cases with a completely negative history is surprisingly large. For example, among nearly 30,000 women who attended for antenatal examination FITZGERALD et al.[17] found 426 women with rheumatic heart-disease, of whom 49% had no history remotely suggesting rheumatic fever. In a miniature radiography survey HARRISON and TAYLOR [18] found that of patients with large hearts who were shown clinically to have rheumatic heart-disease, 46% had no history of rheumatic fever. Among 47,000 recruits passed fit by medical boards BACHMAN [19] found 82 cases of rheumatic heart-disease; and of these, 54 (66%) had no history of rheumatic fever. KAUFMAN and POLIAKOFF [20] found no history of rheumatic fever in 60% of patients over 40 years of age in whom rheumatic heart-disease was proved at necropsy.

Even allowing for the average adult's amnesia for his own medical history, it is clear that the severity of eventual valvular heart-disease is not necessarily related to the severity of preceding manifest rheumatic fever. Cortisone, therefore, even if it does improve the acute phase, will not necessarily lessen subsequent valvular heart-disease. Furthermore, the development of chronic heart lesions can obviously not be prevented by cortisone treatment in the 50% or so of all cases where the patient has not had manifest rheumatic fever. Nor should it be forgotten that rheumatic fever is a recurrent disease, and cortisone treatment of one attack will probably not alter the likelihood of further attacks, which may be followed by chronic valvular changes. It has been postulated that rheumatic fever (which may be mild or subclinical) is the initiating cause of chronic rheumatic heart-disease, but not the continuing cause; and that the continuing cause accounting for the scarring and thickening of the affected valves is a kind of chronic rheumatic "endovalvulitis." If this is true the process could be inhibited only by prolonging cortisone treatment indefinitely. Others think that the valves thicken and scar by fibrin deposition and organisation. MAGAREY [21] has shown that this can happen and may be the chief mechanism of valvular thickening; and it might thus be more logical to try to prevent chronic valvular thickening with heparin rather than cortisone.

With so many unknowns, there is obvious need for further research. BYWATERS [7] has written: "We should do well to remind ourselves first, that the aim of treatment is to prevent cardiac damage; secondly that the criteria for assessment of such prevention are difficult to establish and entail a long term detailed study of comparable treated and control groups." Such a study has been started under the joint ægis of the American Heart Association in the U.S.A. and Canada, and of the Medical Research Council in this country. Patients with active rheumatic fever are to be treated with cortisone acetate, A.C.T.H., or salicylates in conventional dosage.

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17. Fitzgerald, J. E., Webster, A., Zummo, B. P., Williams, P. C. *J. Amer. med. Ass.* 1951, **146**, 910.
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Patchwork

OVER the past two years leading members of the Fellowship for Freedom in Medicine have been playing a larger and larger part in the counsels of the British Medical Association, and nowhere has their influence been greater than in the special committee of the association whose rôle it is to consider what amendments are needed in the National Health Service Acts. In accordance with B.M.A. custom, the original report of this committee was subjected to criticism and modification by other standing committees, and the recommendations eventually adopted by the council [1] were an interim expression of views on some current problems on which there was a prospect of obtaining from the Representative Body a mandate for action. Other more controversial topics will doubtless be the subject of later reports; but, even so, there was enough on the table to give the Special Representative Meeting on Dec. 13 a long and argumentative day. On another page we print some account of this discussion, from which it will be seen that the accent of the meeting was on the whole one of restraint. Even from among these selected recommendations, several of the more sweeping condemnations of N.H.S. machinery were rejected; others were sent back for further examination; while some of those accepted were passed only after substantial modification. We could wish, however, that this process had been carried a great deal further; for the resolutions passed, and therefore now embodied in the B.M.A.'s policy, provide material for a radical and complicated series of amendments of the Acts; and some of them, we should imagine, will be a source of embarrassment to the association and the profession for a long time to come.

From the large pile of proposals the committee had collected, no neat new garment has been designed for the rehabilitation of the health service, but instead something fashioned rather of shreds and patches. These patches often differ in texture and colour, and outsiders may well feel that the most consistent feature of the pattern seems to be the immediate advantage of doctors. The object of many of the alterations is, very clearly, to encourage people to become fee-paying patients again; and to this end regulations are to be made enabling the private patient, while paying his own doctor, to have the benefit of services and medicines supplied by the public. Opinions, of course, differ on whether this fundamental change would strengthen or weaken the N.H.S.; on whether, in the long run, it would be helpful or harmful to the profession; and on whether all citizens are morally entitled to aid in illness whether they put themselves under the care of the service or not. But we shall certainly be surprised if at the present juncture the country takes kindly to plans for simultaneously making medical care more expensive for the public patient and less expensive for the one who pays his doctor.

1. See *Lancet*, Oct. 20, 1951, p. 731.

Already we have the tart comment of the *Times* of Dec. 14:

"When, for instance, the nation is still faced with the question of whether the man who lets the State pay his doctor's bill should nevertheless pay part of the chemist's bill himself, the B.M.A. wants the man who prefers to pay his doctor to be absolved from paying the chemist. While the B.M.A. itself holds that the State might well ask its hospital patients to pay a 'hotel charge,' it also wants people who are not State patients to be able to use public hospitals without paying the full cost of publicly provided board, lodging, nursing and other facilities."

The Representative Body having endorsed so many of its decisions, the B.M.A. council will now have to determine which of these can be put into a practicable programme worth pressing upon a Government that can hardly be eager to introduce avoidable controversial legislation. The suggestions made in its report were, of course, conceived before the present Government came into office, and many of them had had encouraging support from the Party then in opposition but now in power. But it does not follow that, in face of deepening economic difficulties, that party will find it feasible to proceed with these amendments to the National Health Service Acts—especially those that might place an appreciable extra burden on the Exchequer. Furthermore, the report of the Select Committee on Estimates [2] came too late to receive due consideration before the council issued its recommendations. Much that the Select Committee discussed, particularly on such subjects as hospital finance, and on the relative functions and the composition of regional boards and hospital management committees, found its echo in the Representative Meeting; and, with the report of the Select Committee still awaiting Government action, the B.M.A. council will need to study the recommendations of the Representative Body alongside the Select Committee's report, and see whether some profitable suggestions cannot quickly be made to the Ministry in this field. Among these we should not ourselves include the plan for reconstituting the boards and committees, which in its present form we think quite unsound.[3]

Other matters may find their more appropriate hour somewhat later. Though proper arbitration machinery, to which unsolved disputes could automatically be referred, is patently desirable, its creation could with advantage be left until after the next six months, which are to see the oft-postponed examination of the claims of general practitioners for higher remuneration. Again, though the Representative Body happily rejected the council's suggestion that "new and more stringent rules be formulated" to provide sanctions against offending patients, it nevertheless said "that the Minister and the association should draw up a code of conduct for patients; and that the Minister should take determined steps to bring it to the notice of every patient at regular intervals." Useful as such a code might be, it would be no easy task to draw one up, if it is to be couched in such a way that it will be effective and yet be acceptable to Parliament and to the people. To urge the need for a code would be premature until further preliminary work has been done, including perhaps the drafting of a model for constructive discussion with the Ministry. And if it is thought necessary that some form of sanction should still be provided against the patient who ignores the code and persists in behaving irresponsibly, the association must be prepared to say what form this sanction could take, and whether there is any better way than that described by the *Times* as the "proper exercise of the right which every doctor has to remove a patient from his list."

2. *Ibid*, Sept. 29, 1951, pp. 573, 590.
3. *Ibid*, Oct. 20, 1951, p. 719.

Annotations

CORONARY RESERVE

THE healthy heart is remarkably adaptable to changing demands; with vigorous effort its output may increase tenfold. This adaptability depends largely on the coronary circulation, for myocardial requirements are usually met by variations in coronary blood-flow.

The coronary vessels of the normal heart are now thought to be physiologically and functionally end-arteries. Anatomical anastomotic capillaries do exist, but in health these are relatively unimportant for collateral blood-flow.[1,2] Three types of anastomosis are recognised: (1) connections between the terminals of the major coronary branches [3]; (2) extrinsic anastomoses between coronary arterioles and the vessels of the pericardium, mediastinum, or pleura [4]; and (3) coronary anastomoses with the thebesian and luminal vessels. Of these anastomoses the intercoronary are the most important for collateral circulation in coronary occlusion. The extracoronary anastomotic channels may become prominent with syphilitic obliteration of the coronary ostia, and otherwise are important only in surgical procedures to relieve myocardial ischæmia, such as cardiomentopexy. The luminal vessels seem to play no significant part in nourishing the damaged heart except for the superficial endocardium.[5]

In the normal heart an anastomotic circulation does not necessarily develop with ageing. On the other hand, Blumgart [6] found that of patients over 40 years of age with no demonstrable evidence of heart-disease who died of non-cardiac causes, such as cancer, 40% had complete occlusion or considerable narrowing of one or more coronary arteries. Yet, despite these obstructive lesions, the myocardium was usually normal on gross and microscopic examination. The absence of fibrosis or ischæmic infarction in these cases was explained by the finding of larger than normal collateral channels, measured by radiopaque injections of the coronary tree. That slow occlusion permits the proliferation of a compensatory anastomotic circulation has often been demonstrated both experimentally [7,8] and in man.[1,9] In these circumstances the collateral vessels undoubtedly protect the myocardium from damage, but the cardiac reserve is reduced and subsequent sudden occlusion may still result in acute infarction. The older view that coronary atheroma causes progressive narrowing and final thrombotic closure is no longer tenable. Instead we picture the state of the heart-muscle as depending on the interplay of two opposing factors: on the one hand, continuing reduction of blood-flow by progressive coronary occlusion; and on the other hand, development of a compensatory collateral circulation.

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5. Gregg, D. E. *Physiol. Rev.* 1946, **26**, 28.
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BOYS BEGINNING WORK

THE age-old opinion of elders—"Young people are not what they were in my young day"—is very hard to check. Coming generations, however, will be in a better position than we are to assess its accuracy, for they will have various careful reports, made in our own day, on the behaviour of young people. Pearl Jephcott's *Rising Twenty*,[1] published in 1948, told us something about adolescent girls; now a study from Glasgow [2] gives us a picture of boys in the years after they leave school. Dr. T. Ferguson, who holds the chair of public health, and Mr. J. Cunnison, director of social and economic research, both in the University of Glasgow, studied the progress until January, 1950, of the 1349 boys who left Glasgow schools at the age of 14 on Jan. 26, 1947. They found that the boys fell roughly into three groups: boys who at the age of 17 had found their permanent line of work and were in "the higher reaches of occupational status"; boys in medium grades of work; and boys who at 17 were still in stopgap jobs of the lower occupational grades. The boys in the first group, who make up about half the total, were in the main interested in their work and steady in it, not moving capriciously from job to job but only changing for a good reason; they had seldom been unemployed, and a fair proportion of them belonged to regular social groups—whether in clubs (about a third of them), at church (nearly half), or in evening classes (some 16%). The boys in the third group (who accounted for a quarter of the total) were noticeably restless in comparison, moving often from job to job and usually for unsatisfactory reasons; they were indifferent to or disliked their work, and had been unemployed more often than those in the first group; they made poor use of their leisure time, barely a fifth of them belonging to clubs, a third to churches, and only about 2% attending evening classes.

At the time of leaving school all the boys were assessed by their schoolmasters on scholastic ability, personality, and physical development; and these three things seem to have had considerable bearing on their later success, those who scored highest in them being, broadly speaking, those who were doing best at the age of 17. The most regular leisure activity, for all the boys, was a weekly visit to the cinema, and Professor Ferguson and Mr. Cunnison, unlike other observers, find some correlation between cinema-going and delinquency. Boys who had not been cinema-goers when they left school but had become fans by the age of 17 were among those in whom the conviction-rate was highest, whereas delinquency was uncommon among lads who had never been cinema-goers. Other influences were undoubtedly at work as well: thus the undersized boys were among the most devoted cinema fans. The conviction-rate among boys in permanent jobs was only 4·3%, whereas among those in stopgap jobs it was 14·3%. Some of the boys had committed their first offence while still at school: in fact, 44% of the total convictions of boys in the series occurred while the offenders were schoolboys. It is curious and noteworthy that the proportion of convictions recorded during schooldays was much higher among boys living in good or fairly good working-class districts than among boys from slum or "new" housing areas. (The "new" housing areas were not composed entirely of newly built houses: they included reconditioned properties where slum populations had been rehoused as a half-way measure.) Convictions while at school were not common among boys from broken homes but were common among those who were considerably underweight, and still commoner among boys employed out of school hours.

In adolescence unskilled work, unfortunately, often carries a higher wage than skilled work; so the level of wages of boys living in poor areas tended to be high. Many of the boys in permanent work were training for skilled or semi-skilled jobs and were getting lower wages than the unskilled boys. Half of them had chosen their work for its interest, 17% because it offered security, only 12% for good wages, and just over 1% for its social standing.

There seems to have been little connection between the amount of sick-leave from work, and the general physical assessment of the boy at school-leaving age: indeed, among stunted and underweight boys the proportion who had no sick-leave was above the average. The sickness leave for the whole series averaged 6·8 days per boy per year over the 3 years of the survey. High figures for sick-leave were apt to be associated with unskilled work at low wages, and frequent changes of job. It was higher among boys from good homes than among boys from poor homes, among those from less crowded than those from overcrowded homes, and among those from small families than those from large. In other words (though the surveyors do not say so) there are some homes where it is thoroughly uncomfortable to be ill.

TREATMENT OF INTRACRANIAL ANEURYSMS

THE best method of treating intracranial aneurysms, and in particular those which give rise to subarachnoid hæmorrhage, is still undecided; but the lesions can now be located with some certainty. Speaking at the Royal Society of Medicine on Oct. 20, Dr. J. G. Norlen, of Stockholm, said that carotid angiography should be used not only to show the size and position of an aneurysm but also whether it had a neck, its relation to the other intracranial arteries, and the adequacy of the collateral circulation. In his experience an aneurysm can be found by angiography in about 90% of cases of subarachnoid hæmorrhage.

Since August, 1950, efforts have been made at the Serafimer Hospital to treat intracranial aneurysms by direct surgical attack rather than by carotid ligation or conservative measures. Altogether 44 patients have been operated on. In 34 it was possible to ligate the neck of the aneurysm, in 6 muscle was wrapped round the outside of the aneurysmal sac, in 2 the aneurysm was "trapped" between clips, and in 2 no definitive treatment was possible. There were only 3 postoperative deaths: in 1 case the cause was extradural bleeding; in the 2nd the patient did not regain consciousness after operation; while in the 3rd the patient, who had bilateral carotid aneurysms, died on the day after operation. Hemiplegia developed after operation in 4 cases; in 1 this remained complete, in 2 there was partial recovery, and in the 4th complete recovery. The follow-up period is obviously too short to assess the ultimate results; but Dr. Norlen indicated that apart from subclinical carotid aneurysms, where carotid ligation gives good results, definitive surgery seems to be the right treatment in many cases.

In the subsequent discussion Mr. Murray Falconer emphasised the importance of investigating a patient with subarachnoid hæmorrhage at the earliest possible moment. He advised carotid angiography within two to three days of the hæmorrhage and, if this shows no abnormality, vertebral angiography a few days later. He also advocates early surgery in subarachnoid hæmorrhage due to intracranial aneurysms.[1 2] Sir Geoffrey Jefferson, F.R.S., with his great experience, suggested that caution is needed in these cases: few, if any, patients die of subarachnoid hæmorrhage of itself—the cause of death is usually an associated intracerebral hæmorrhage or

1. See *Lancet*, 1948, ii, 698.
2. The Young Wage-Earner. London. Published for the Nuffield Foundation by the Oxford University Press. 1951. Pp. 194. 8s. 6d.

1. Falconer, M. A. *Brit. med. J.* 1950, i, 809.
2. Falconer, M. A. *J. Neurol. Neurosurg. Psychiat.* 1951, **14**, 153.

cerebral ischæmia. He described the pathological features that may rule out operation on an aneurysm. Vessels may actually pass out of the aneurysm to supply the brain; ligation of the neck of the aneurysm may be impossible without damaging perforating arteries; more than one aneurysm may be present; or the shape and size of the aneurysm may preclude direct attack. Carotid ligation, in his view, is often a most useful procedure—and not only for aneurysms of the internal carotid artery itself. In his department ligation has been performed in 142 cases. Of these patients, 13 died within six weeks of ligation (6 from a second rupture of the aneurysm), and 4 died later owing to the aneurysm. Mr. R. T. Johnson discussed the 11 patients of this series of 142 in whom hemiplegia developed after carotid ligation: this complication, which usually appears 24–48 hours afterwards, seems to be due to the cumulative effects of cerebral ischæmia rather than to actual thrombosis.

The results of these various operative measures must be compared with the mortality of subarachnoid hæmorrhage treated medically. In various series this has ranged from about 50 [3] to 28% [4] for the first attack; but, as Sir Charles Symonds pointed out at the meeting, such figures are derived from patients admitted to hospital, and there are undoubtedly less severe cases, not included in hospital statistics, in which spontaneous recovery ensues.

CLEANER RIVERS

THE Rivers (Prevention of Pollution) Act is now in force in all "river board areas" in England and Wales. The new Act repeals and replaces the former inadequate Rivers Pollution Prevention Acts and various local enactments; henceforth the law is contained in a single statute and the penalising of pollution becomes more purposeful.

Optimists, however, if they think the battle for clean rivers is won, may be disappointed. Because the country needs coal, the waters which drain from mines into a stream are prima facie protected. The export drive, the rearmament programme, and the restriction on capital investment combine to discourage severity towards trade effluents and hold back the construction of plant for sewage disposal or the treatment of industrial wastes. A circular sent out by the Minister of Housing and Local Government emphasises the improvements introduced by the new law. Section 2 makes it an offence to let matter enter streams which either (*a*) is poisonous, noxious, or polluting, or (*b*) impedes the flow so as substantially to aggravate pollution due to other causes. It is thus no longer necessary to prove either that the flow is actually interrupted or that any matter is in itself polluting. Section 3 gives jurisdiction to a county court, if pollution exists or is apprehended, to prohibit or regulate any use or proposed use of a stream or of land. But section 8 confers immunity for seven years (the period may be reduced or extended by Order in Council) from proceedings under sections 2 or 3 without the Minister's consent if they relate to trade effluents or local authorities' sewers. The Ministry claims that "now for the first time" local authorities, industrialists, and traders will have "clear and precise information about the conditions which must be satisfied when effluents are discharged into streams."

Expectancy, it seems, must be tempered with patience. The all-important "standards" with which effluents will have to conform have still to be prescribed by the by-laws of river boards. The by-laws will determine what is poisonous, noxious, or polluting within the meaning of the Act, and they may deal with temperature and discoloration. But a board is not to prescribe standards until it has surveyed the conditions in its area; notice of proposed by-laws must be advertised and objections considered; the by-laws, naturally, must be submitted to Whitehall for confirmation. Meanwhile, according to the Ministry's circular, the technical questions which should be covered are receiving close attention from an informal committee of experts whose first conclusions will presently be embodied in a document available for general guidance.

We must wait and see. Acts of Parliament sometimes have a persuasive rather than a mandatory effect. The Minister pleads for the "wise and patient administration by river boards" which is able, in spite of present difficulties, to bring about many improvements "without hardship and within a reasonable time." The plea deserves support; we all want cleaner rivers.

INTRA-ABDOMINAL BIRTH INJURIES

POST-MORTEM examination of newborn babies [1] has shown that birth injuries of the abdomen are much less rare than clinical evidence suggests; for such injuries are rarely diagnosed during life. The organ most commonly damaged is the liver; but injuries to nearly all the abdominal viscera have been described,[2] and Lundqvist [3] reported 12 cases of intraperitoneal hæmorrhage without obvious source. Hæmorrhage is usually the cause of death, but the injury may not be fatal at once; indeed, the baby may seem quite normal at birth and the appearance of signs may be delayed for a few days until a hæmatoma ruptures and further hæmorrhage takes place.

Injuries to organs other than the liver have rarely been recognised and treated; but Corcoran and Strauss [4] in 1924 described the case of a baby who survived after a large hæmatoma of the left suprarenal gland had been removed and the bleeding-point ligated. The first case of hepatic injury treated successfully was reported by Rogers [5]; and now Arden,[6] who in 1946 described his first case from the Brisbane Children's Hospital, has seen 5 others with only 2 deaths. The average weight of the babies was 9 lb. 6 oz.; but they were all born without undue difficulty, and all seemed normal at birth. After an interval varying from 36 to 104 hours they suddenly became ill, with pallor, breathlessness, tachycardia, abdominal distension, and dullness in the right flank. Paracentesis in one case yielded dark blood. The babies were treated by the immediate transfusion of 15–20 ml. group-O blood per lb. body-weight, followed by a further 10–15 ml. per lb. slowly, and the administration of 10 mg. of 'Synkavit.' In the first 2 cases, when the circulation had been restored, laparotomy was undertaken, and the torn liver sutured; in 1 of these further bleeding was successfully treated by transfusion alone. The 2 most recent cases were therefore also treated conservatively; and once the anæmia had been corrected the babies seemed well and untroubled by the large quantities of blood remaining in their abdominal cavities.

In Arden's series the large size of the infants was apparently the only ætiological factor; but accounts of fatal cases of intra-abdominal injury seem to suggest that there are others, the avoidance of which may reduce the incidence. Trauma is of course most likely to lead to serious bleeding in the presence of any hæmorrhagic tendency or of the venous congestion associated with "asphyxia"; and rupture of the liver, spleen, or bladder is particularly likely when these organs are pathologically enlarged. The manipulations incidental to breech delivery may damage the liver or adrenals by bending or compression of the abdomen, and compression

3. Hyland, H. H. *Arch. Neurol. Psychiat.* 1950, **63**, 61.
4. Ask-Upmark, E., Ingvar, D. *Acta med. scand.* 1950, **138**, 15.

1. Potter, E. L. *J. Amer. med. Ass.* 1940, **115**, 996.
2. Ehrenfest, H. Birth Injuries of the Child. New York, 1931.
3. Lundqvist, B. *Acta obstet. gynec. scand.* 1930, **9**, 331.
4. Corcoran, W. J., Strauss, A. A. *J. Amer. med. Ass.* 1924, **82**, 626.
5. Rogers, G. *Amer. J. Obstet. Gynec.* 1934, **27**, 841.
6. Arden, F. *Med. J. Aust.* 1951, ii, 632.

of the thorax or traction on the umbilical cord may tear the ligaments of the liver and spleen. The baby may be injured before delivery as the result of version, or during labour by excessive fundal pressure, or after birth by unduly vigorous attempts at resuscitation, especially "swinging."

It is clearly advisable that large babies, and all those born after a difficult labour, should be handled carefully and should be watched, so that if the symptoms of internal hæmorrhage appear treatment is not delayed.

AN INTERNATIONAL CONGRESS ON LIVER DISEASE

INTERNATIONAL scientific congresses are usually formal affairs, lacking spontaneity and opportunities for really intimate exchange of opinion. Neither of these disadvantages was evident at the small informal congress held at the Ciba Foundation, London, in July, 1950, when hepatic disease was discussed. An almost verbatim report[1] of this symposium conveys the pleasant informal atmosphere of the meetings and the correspondingly uninhibited contributions of the participants.

On this occasion P. György described the results of his study of the mechanism underlying the massive necrosis of the liver in rats fed on a diet deficient in vitamin E and the thio-amino acids. Since both these groups of substances are in-vivo detoxifying agents, the hepatic injury may be due to the accumulation of toxic factors usually rendered harmless by an adequate dietary intake of tocopherols or methionine; and the tendency for this type of hepatic necrosis to affect the left half of the liver, which normally receives its portal blood from the left half of the colon, directed attention to the intestinal flora as the source of the hypothetical toxins. The effect of antibiotics on the death-rate from hepatic necrosis, however, only partly supported this hypothesis. 'Aureomycin,' terramycin, streptomycin, and sulphaguanidine all delayed but did not prevent death. György regards this as supporting the bacterial toxin theory, since resistant strains ultimately emerge with continued administration of the antibiotic. L. E. Glynn, however, emphasised our ignorance of the metabolic activity of these powerful antibiotics and the great likelihood of a systemic action that could account for the observed results independently of any antibacterial action. The final decision on this point will come from György's experiments in the germ-free animals bred in the special laboratories at Notre Dame University, Chicago.

A beautifully illustrated account by S. Hartroft demonstrated the remarkable changes in the liver from diets deficient in choline. These include not only fatty infiltration but huge fatty cysts from the fusion of fatty vacuoles in adjacent cells. The expulsion of the contents of these cysts into the biliary or blood vessels was also demonstrated. The possibility that some of these appearances may have been due to artefact was not mentioned; but large globules of fat may easily be displaced when cutting frozen sections of very fatty organs, and these could perhaps account for many of the intravascular globules in Hartroft's preparations. The presence of fatty emboli in the lungs and kidneys, does, however, indicate that the process was not entirely artefactual.

The problem of portal hypertension and ascites excited many stimulating contributions, each of the well-known ætiological factors having its sponsors. W. Volwiler cited experiments showing lack of correlation between portal hypertension and ascites but the importance of portal hypertension in localising the fluid in the abdomen when other causes promote excessive loss of fluid from the circulation. H. G. Kunkel classified cirrhotics into two groups according to the associated disturbances leading to ascites: in cirrhosis due to alcoholism ascites is associated with severe sodium retention, whereas in postnecrotic or posthepatitic cirrhosis the electrolyte changes are less marked and the condition more susceptible to changes in serum-albumin. P. Iverson, whose cases of cirrhosis were mostly of the posthepatitic variety, found remarkably close agreement between the osmotic pressure of the plasma-proteins and the incidence of ascites. When the colloid osmotic pressure exceeded 220–240 mm. of water, ascites did not occur; below this level ascitic fluid steadily accumulated. On this basis he interpreted the rise in serum-globulin as compensatory for the deficient production of albumin; and he showed that, despite its lower osmotic effect, a considerable increase in globulin could compensate for a smaller deficiency in albumin. In agreement with Kunkel he brought forward some evidence that in portal cirrhosis the osmotic pressure of the colloids is less important than other factors, of which the increased portal pressure seems to him the most important. T. C. Chalmers, however, adduced evidence suggesting that the difference in the mechanism of ascites between the two types of cirrhosis was due mainly to the difference in chronicity. Alcoholic or fatty portal cirrhosis is usually of long standing, and the body is depleted of salt by repeated paracenteses. The failure of intravenous albumin in alcoholic cirrhosis he attributed to increased capillary permeability from long-continued dietary protein deficiency. Evidence of this effect of nutrition on capillary permeability was given by R. M. Kark, whose colourful charts illustrated a case in which intravenous albumin at first passed rapidly into the ascitic fluid, whereas after a period of high-protein feeding a similar injection was retained within the vascular system.

The final session included an excellent discussion on bile-pigment metabolism with special reference to the chemical and clinical significance of the differences between the direct and indirect acting pigment in the van den Bergh reaction. Miss M. M. L. Pritchard showed angiograms of the rat's liver suggesting the possibility of a shunt mechanism; and finally A. R. Stokes presented the results of the successful culture of infective hepatitis virus both in tissue-culture of embryos and in the amniotic fluid. These cultured viruses did not give rise to the full clinical picture of infective hepatitis; but in susceptible people they consistently produced a non-icteric form of this disease, usually with nausea, vomiting, and a tender hepatomegaly. Nevertheless, before such cases were accepted as true hepatitis at least three positive liver-function tests were required. A skin test with the cultured virus has been developed by Stokes and his associates, and the convincing results of the first 5000 tests were presented.

The Ciba Foundation are to be congratulated on the undoubted success of this conference, and especially for aiding the publication of the proceedings in book form.

1. Liver Disease: a Ciba Foundation Symposium. Edited by SHEILA SHERLOCK, M.D., F.R.C.P., and G. E. W. WOLSTENHOLME, O.B.E., M.A., M.B. London: Churchill. 1951. Pp. 249. 25s.

ON Dec. 14, which is his actual birthday, the King conferred the honour of knighthood on Mr. CLEMENT PRICE THOMAS and Dr. GEOFFREY MARSHALL, and invested them with the insignia of knight commander of the Royal Victorian Order. Mr. Price Thomas, who performed the recent operation on the King, is surgeon to the Westminster and Brompton Hospitals, and a pioneer of modern thoracic surgery whose reputation extends far beyond this country. Dr. Marshall, who was one of the physicians in attendance on His Majesty, is consulting physician to Guy's Hospital and physician to the Brompton Hospital, where he has gained the respect, the confidence, and the affection of colleagues of all ages.

Special Articles

COALMINERS' PNEUMOCONIOSIS

EMPLOYMENT PROBLEMS OF THE DISABLED*

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"The prevention of disease is fully as reliable a testimony of professional skill and scientific knowledge as its treatment; whilst it is generally considered to constitute a surer evidence of the possession of that disinterested and noble philanthropy which should ever characterise the disciples of physic."—W. I. Cox (1857).

SINCE 1931, and more particularly since 1943, the serious incidence of pneumoconiosis or dust disease of the lungs among coalminers has compelled public attention. The problem is not merely the medical care of thousands of affected workmen, but also the social and economic effects of their illness on their families, the community, and the nation.

Under the Coalmining Industry (Pneumoconiosis) Compensation Scheme, 1943, pneumoconiosis of coalminers was recognised as an industrial disease for the purposes of workmen's compensation. During the next five years, until the National Insurance (Industrial Injuries) Act, 1946, came into force, on July 5, 1948, a worker receiving compensation for pneumoconiosis was permanently barred from almost all work in the mines. This was because current medical opinion held that it was dangerous for a workman with pneumoconiosis to continue working underground. So each year, between 1943 and 1948, thousands of miners, mostly in South Wales, obtained compensation; and, to comply with the law, gave up their skilled occupation. The great majority were only slightly affected and were capable of work under normal conditions in other industries. So long as war production was maintained in the factories, these men readily obtained suitable alternative employment, often at a much higher wage than they had earned in the mines; but after the war they became redundant, and in the narrow area of the South Wales coalfield thousands of men were soon out of work, with little or no prospect of local employment.

The situation became critical, and worsened; and it quickly attracted the attention of the authorities. Various schemes—such as the Grenfell factories, were devised to try to solve the problem; but all, as might have been foreseen, completely failed.

It is scarcely fair, however, to say that some of the miners "bitterly resented the regulations of the Workmen's Compensation Act which took their jobs away from them"; and that "work was unnecessarily taken away from them by well-intended but misguided regulations" (*Brit. med. J.* 1951, i, 1129). Under the compensation schemes workmen were absolutely free agents and were fully aware of the conditions attaching to compensation. Many adopted this means of circumventing the Essential Works Order so that they could leave the pits and work for higher wages in war factories.

When the National Insurance (Industrial Injuries) Act, 1946, became operative on July 5, 1948, the pneumoconiosis disablement provisions were amended so that workmen affected by pneumoconiosis without tuberculosis could obtain benefits and yet remain free, save in exceptional cases, to continue to work underground. The effect of this Act is revealed by the fact that in the ensuing two and a half years—that is, to the end of 1950—about 5500 of the affected miners remained at work in the industry. In this way the problem of rehabilitation and resettlement has been reduced. So far as I am aware, it has never been explained by the authorities whether this alteration of attitude to the continued employment of affected workmen in the mines was justified on medical grounds, or by the reduction of dust in the mines, or whether it was simply an expedient to mitigate the disaster of unemployment among the disabled.

The next step was inevitable. Failure to provide suitable alternative work was at once acknowledged and resolved officially on June 4, 1951, when regulations were enacted providing that:

"Men suspended under the Workmen's Compensation Acts because of pneumoconiosis or silicosis, unaccompanied by tuberculosis, may now take up employment in the coalmining industry if they are passed by a pneumoconiosis medical board as fit to do so."

This scheme, of course, is entirely voluntary; the workman alone decides whether or not he shall seek readmission to the mines.

It is, I admit, a solution; indeed it is the only one possible in the circumstances; but unless supplemented by other measures it will, sooner or later, prove a bad one. In fact, unless we institute and maintain these other measures with urgency and vigour, we shall prove unequal to our responsibility. My contention is quite simple—namely, that the fundamental need and challenge is not the rehabilitation and resettlement of miners disabled by dust, but the rehabilitation of mines rendered unfit by mechanisation. This responsibility devolves almost entirely on the industry, men, and employers, separately and conjointly.

HISTORICAL ASPECTS OF PNEUMOCONIOSIS OF COALMINERS

In one way pneumoconiosis is unique among the occupational diseases of coalminers. Thus it was extremely prevalent between 1820 and 1850, but thereafter the incidence declined; and between 1875 and 1920 the disease almost disappeared altogether, only to recur in epidemic proportions between 1920 and 1950.

Originally, the highest incidence was in Scotland, today it is in South Wales. From existing descriptions it is clear that the disease and the associated problems were the same then as now.

In 1834, Dr. Steele of Midlothian recorded the serious prevalence and ravages of the disease; and, referring to John Cowan, aged 58 years, a coalface worker, wrote:

"He was compelled to abandon working in the mine, but he continued to do light work above ground until rendered unfit."

And again:

"The man determines to give up stone-working, and does so for a time, but the inducement of a higher rate of wages again tempts him to his destruction."

In 1866, writing on anthracosis or coalminers' phthisis, Warburton Begbie, the most distinguished Edinburgh physician of his time, records:

"The disease now threatens to become very rare in its occurrence; there are indeed indications of its happily disappearing altogether."

Ten years later, in 1876, Dr. W. T. Gairdner, regius professor of medicine in the University of Glasgow, speaking of the disease said:

"This special form of pathological lesion has so much diminished of later years, in consequence of improved sanitary precautions, as to be almost quite extinct."

These statements, even by such distinguished physicians, should not be interpreted too literally. What we now designate as simple pneumoconiosis persisted; what really diminished was the more advanced disabling

* A paper read before the section of physiology of the British Association on Aug. 9, 1951.

condition, complicated pneumoconiosis, characterised at necropsy by massive fibrosis.

From other writings of the same period it would appear that "improved sanitary precautions" referred to the improved ventilation of the mines made necessary by deeper workings remote from the shaft. The control of pneumoconiosis was incidental and probably accidental, and resulted from the effective dilution and dispersal of the concentrations of airborne dust. Thus, other things being equal, the present recurrence of the disease would suggest some failure in these sanitary precautions. Speaking to the Institution of Mining Engineers at Nottingham, in November, 1949, Sir Andrew Bryan, H.M. Chief Inspector of Mines, said:

"In short, my proposition on this coal-dust problem is that the production of coal-dust in mines has increased in recent years, is still increasing and should be reduced."

The fact is that mechanised coal-cutting and conveying has reproduced the primitive dusty conditions of a century ago. On this occasion, however, better ventilation is no longer the prime remedy; there must be less dust production both by men and machines.

GEOGRAPHICAL DISTRIBUTION OF THE DISEASE

As I have already said, at present the focus of the problem is in South Wales, though in this area mechanisation was introduced later than in several other coalfields, and is even now not as advanced. Since 1944 the annual number of certified cases in South Wales has been about 3000 partially disabled and 350 totally disabled, whereas the figures for all the other British coalfields combined are 450 and 150 respectively. Relating certification to populations at risk, Dr. C. M. Fletcher has summarised the position by stating that throughout the period 1930–48, the prevalence of pneumoconiosis was forty times as great in South Wales as in the rest of the country. It is important to realise that prevalence, in this context, merely relates to certification, and not to the actual incidence of the disease in the separate areas. Furthermore, some recent statistics prepared by the Ministry of National Insurance from official records for the period April–December, 1950, provide a more detailed statement of the incidence of certifications in the various coalfields (table I).

Again it is important that these figures and estimates should not be misinterpreted. They are not a true measure of the occurrence of the disease in separate coalfields; they simply denote the numbers of cases diagnosed and assessed by the pneumoconiosis medical panels under the National Insurance (Industrial Injuries) Act, 1946.

By reason of a definite policy pursued by the miners and their union in South Wales, the medical arrangements, statutorily established for certification and disablement assessment, have been used to provide an irregular system of periodic medical and radiographic examinations for men at work, irrespective of whether or not these men

TABLE I—PNEUMOCONIOSIS IN BRITISH COALMINERS IN 1950

Area	Working population (1000's)	Assessed cases, Annual rate per 1000	Boarded cases, Annual rate per 1000
Wales, Monmouth, Forest of Dean, Bristol, and Somerset	105·9	18·91	32·58
Kent	6·0	14·20	18·00
N. Staffordshire, S. Staffordshire, Carmoch, Shropshire, and Warwick	54·5	5·33	6·53
Scotland	80·8	5·21	7·33
Lancashire and North Wales	56·3	3·60	6·04
Durham	106·8	2·19	3·40
Yorkshire	134·0	1·79	3·04
Northumberland and Cumberland	48·7	0·54	1·23
Nottinghamshire, Derbyshire, and Leicester	94·7	0·31	0·51

TABLE II—DISPOSAL OF APPLICATIONS APRIL–DECEMBER, 1950

Area	Negative on scrutiny %	Disease not diagnosed %	Disablement (% assessment) % under 20	% 20	% over 20	Number of applicants
South Wales	54	19	17	6	4	6441
Scotland	31	18	1	6	44	630

suffered any symptoms. As a result, certifications probably constitute a fairly comprehensive index of the incidence of the disease in South Wales. The recent trend of these assessed cases suggests that the peak has been passed; but there is, as yet, no evidence of a slump.

In some other coalfields the approach has been entirely different; men have presented for examination only when sick and unfit for work. Accordingly, assessed cases in these areas are not a measure of the incidence of the disease. Recently, however, disturbed by publicity about the disease and its consequences, more and more men in these areas have been seeking examination by the medical boards, and the number of assessed cases is mounting year by year. This is well exemplified in Scotland where certifications have steadily increased from 109 cases in 1944 to 421 in 1950.

These submissions are admirably illustrated by a comparative analysis of all cases claiming a medical board in South Wales and Scotland in April–December, 1950 (table II).

Further proof of this different approach in separate areas emerges from mass-radiography surveys outside South Wales. In a recent survey as many cases—previously undiagnosed—were discovered at work in one large pit, as had been diagnosed and assessed throughout the whole coalfield, employing 70 times the number of men, during the whole of the previous year.

Indeed it seems reasonable to conclude that the incidence of diagnosed cases of pneumoconiosis in any coalfield or district varies directly with the number of radiographic examinations carried out among experienced underground workers; so that a serious rise in the number of cases of pneumoconiosis should be anticipated when any system of periodic radiographic examinations is introduced.

DISEASE AND DISABLEMENT

It has already been stated that since 1943 thousands of miners in Great Britain have been assessed as disabled, in greater or lesser degree, by pneumoconiosis. Despite the large number of these casualties, I submit that in the matter of re-employment, pneumoconiotic miners cannot be considered apart from their comrades, in mining and other industries, who have been disabled by accident, non-occupational diseases, and advancing age. It may be argued, however, that the sufferers from dust disease of the lungs, by reason of the occupational origin of the disease and the unnatural conditions of mining, merit special consideration. In asserting this proposition it should not be overlooked that doctors are enabled by various tests, particularly radiographic examination of the chest, to identify the pneumoconioses, whereas other disabling conditions, such as emphysema, rheumatism, and cardiovascular degeneration, though now classified as non-occupational, may equally well be caused or, at least, aggravated by underground work. Moreover, coal-mining is not by any means the only hard, dangerous, and uncongenial occupation.

Without pursuing the details of the argument, I would say that, judged entirely by the nature of the disease and accompanying disability, even admitting the tendency to aggravation in time, the pneumoconiotic

coalminer does not present any peculiar problem that requires specific arrangements for his re-employment. Indeed, compared with other disabled workers, other factors being equal, the miner usually has the advantage of greater physical fitness.

The relatively high incidence of casualties in a narrow geographical area may, as we have seen in South Wales, constitute a serious local problem calling for special measures. Experience has already demonstrated that private industrialists, usually for good and sound reasons, are not eager to assume this burden by establishing or moving their undertakings to this "special area." Statutory measures under the Disabled Persons (Employment) Act, 1944, have also proved equally ineffective.

Reluctantly I am compelled to one conclusion—namely, that almost the entire responsibility for the continued employment of the pneumoconiotic coalminer must be accepted by and within the mining industry and its associated undertakings. What is needed, I repeat, is not the rehabilitation of disabled coalminers, but the rehabilitation of unfit coalmines. In this task the main burden must fall on employers and mining engineers, not on doctors and sociologists. At the same time, there can be no speedy amelioration without the vital coöperation of the men themselves and their unions. This, at once, constitutes a challenge to discipline and leadership.

If, as the problem demands, the attack is to be hard and swift, there are several important requirements which must first be fulfilled. Firstly, the whole problem must be extricated from "politics"; secondly, we must realise that pneumoconiosis of coalminers is not peculiar to South Wales; thirdly we must get rid of the emphasis on disease and compensation; and finally, we must accept that our existing knowledge of the cause of the disease is already adequate to enable us to institute and maintain effective prevention. Mining engineers in South Wales, by such methods as water infusion, have already made a useful start. In fact this justified the Medical Research Council's statement, in December, 1950, that "the situation, though present, is essentially the product of circumstances now past." While this may be true of South Wales—and I am far from convinced—can the same be equally claimed for the other colliery divisions?

The clamant demand is for more coal—higher and greater production. To this end mechanisation and more mechanisation, and more men to work the machines, is the invariable answer. Dare we pause for a moment to examine the situation? Are we quite certain that in some mines more coalcutters and longer conveyor belts are not indirectly diminishing output by damaging the health of the men?

It has become almost trite among doctors to say this is an engineering problem. Until the disease is controlled—and I doubt if complete prevention is possible so long as we use raw coal—so as not to shorten life or seriously impair health during a normal working span, then the doctor must play his full part in the team. And let us be quite clear that in this field of mining the doctor is simply an expert adviser; he is not the director in charge of operations.

In the degradation of the coal and other minerals, the production of dust must be kept to the minimum; even so, much dust is unavoidable, and the occurrence, and in certain circumstances the progression, of the disease will be proportional to the number of mines that contain dangerous concentrations of airborne dust. The doctor has two main duties: (1) to assist the engineers to locate the dangerous operations and stations; and (2) to supervise the health of affected men still at work. But engineers and doctors can only accept commitments commensurate with their resources. This means that their efforts shall be purposeful, properly planned, restricted, and directed to achieve the end with the minimum of delay.

Since 1944 young entrants to the pits have been subject to initial medical examination, but only in South Wales has this examination statutorily included radiographic examination of the lungs. This valuable scheme must be made uniform throughout Great Britain and extended to include a regular follow-up of these "new miners." If this scheme is efficiently carried out, then, in the course of ten or twenty years, it will provide an index of present environmental conditions and the influence of concurrent preventive measures associated with increased mechanisation. Short-term evidence of improvement in underground conditions must depend on physical measurements. These at present, for a variety of reasons, are difficult, and must always be imperfect and unsatisfactory, because there is definitely an individual predisposition to the development and progression of the disease. This is properly a matter for fundamental research; so it has been for over a century, and, as an early solution is unlikely, the urgent need is to press on vigorously with practical preventive measures of dust control.

Many affected men are able, and have elected, to continue in underground work. For some it is possible to arrange employment at less dusty stations, or as officially designated, "work in approved dust conditions." Let us be quite clear that approved is not the same as safe; but I agree that these conditions, as defined in terms of dust concentration, represent practicable targets at which to aim in the first round. By implication certain working places are not approved, and presumably these must be taken over by young fit men. Instead of this internal transfer of men, might the same purpose not be achieved by restricting affected men to a reduced number of shifts each week?

The real crux of the problem, however, is to persuade a man in the prime of life, say between 30 and 40 years of age, who is not aware of any disease, to accept £6 a week instead of £12; especially at the time of his heaviest social and domestic commitments. His wife too must be convinced of the wisdom of the advice and be willing to make the sacrifice.

Pneumoconiotics, who continue in underground work, run the risk of progression of the disease and aggravation of their condition. Surely it is not beyond our administrative resources to provide for them facilities for regular medical supervision and expert advice. The present annual review by the pneumoconiosis medical boards does not fulfil this.

Finally, our knowledge of coalminers' pneumoconiosis after nearly one hundred and fifty years of observation, study, and research is still very imperfect. Even so, we know enough for action. The significant truth was enunciated by Calder in 1851, precisely a century ago, and I can do no better than quote:

> "Prophylactic measures are equally called for, whatever theory of the nature of the disorder shall ultimately prove to be correct."

The cause is worthy; we have the capability if only we have the faith and purpose. If any doubt, let them remember that it was our generation that achieved the seemingly impossible; we built the Mulberry harbours in time. The fight is again for life—individual and national.

"Science is not parochial; properly speaking, it is the whole body of systematic knowledge. Its antithesis is not, as those who should know better often suggest, religion or humane studies or idealistic philosophy or dialectical materialism. The antithesis of science is ignorance and muddle."—Prof. R. J. PUMPHREY, *The Origin of Language*, Liverpool, 1951.

BRITISH MEDICAL ASSOCIATION

Reform of the Health Service

A Special Representative Meeting of the association was held on Dec. 13, under the chairmanship of Dr. S. WAND, to discuss the first interim report by the council on reform of the National Health Service. Representatives unanimously approved the report's provisions for compulsory arbitration, free drugs and appliances for private patients, and grants-in-aid for patients in private pay beds; they demanded disciplinary arrangements for patients, but a call for "new and more stringent rules" was altered to "a code of conduct"; and they referred back a proposal for abolition of amenity beds.

OBJECT OF THE COUNCIL'S REPORT

Dr. H. H. D. SUTHERLAND, chairman of the amending Acts committee, described the interim report as a great constructive effort on behalf of the country. "The National Health Service is in action, but to the knowledge of most it is not working nearly as well as it should," he declared. "It has difficulties inherent in itself and of its own creation. It does not give the best service, and by its very set-up has caused dismay, anxiety, and frustration among all sections of the medical profession. In some ways it is far too costly, and in others parsimonious."

The object of the report was to make the service not only more economical but one in which all sections of the profession could coöperate with good will for the benefit of the public. "We want to make the National Health Service a great success—one in which the country can take pride, and one in which we can work in accordance with the highest professional traditions." Dr. Sutherland concluded:

"No modern State, either in peace or war, can survive without the work and interest of its doctors. We say to the State, to Parliament, to the public, and to the press: 'You want the best doctors and the best service. We can give them and it to you. But—and it is a big but—you ought now to consider the very urgent needs of the medical profession whereby they may be enabled to give their best service to the public.' Let it be clearly understood that we are not here today to seek any sectional interest of the profession, any unfair and invidious advantage—there must be no suspicion of that at all."

PROPOSED COURT OF ARBITRATION

Amid applause the meeting agreed that an amending Act should provide for a National Health Service court of arbitration, whose decisions would be binding on both sides, but that the proposed arbitration on remuneration should be carried to a conclusion without waiting for any amending Act.

The interim report proposes that the court should be composed of a legally qualified, independent president appointed by the Lord Chancellor; other members, having special knowledge of the subject-matter, should be selected by the Lord Chancellor in equal numbers from panels nominated respectively by the management and staff sides of the Whitley Council. The council's recommendation was approved. It was resolved that the Minister's powers to change by regulation the conditions of service (including remuneration) of any section of the profession should be restricted to those items which were either agreed by the medical profession or determined by arbitration.

PAYMENTS IN HOSPITAL

The meeting agreed that section 5 of the Act of 1946 should be altered so that the Minister must set aside beds for paying patients and allow any medical practitioner serving on a hospital staff to arrange for the treatment of private patients at that or any other hospital, making available accommodation for the purpose; at present the power is permissive. It was left to the council to see that this section should also provide, in the terms of an amendment from Wembley, "that the general practitioner may charge fees for professional attendance on any patient on his National Health Service list while in hospital or nursing-home who elects to obtain private treatment in a private ward."

Another amendment agreed to by a majority was that all reference to a maximum charge should be abolished. Dr. P. A. MCCALLUM (Torquay) described this as an unnecessary control. A patient could get a "first-class job" for nothing; surgeons had always been willing to suit their fees to the ability of patients to pay. Regional boards had exercised precious little control over fees for private wards; why control the doctor or surgeon? Dr. R. M. S. MCCONAGHEY (Torquay) suggested that the maximum scale was a gross insult to consultants and specialists.

PURCHASE OF EQUIPMENT AND PREMISES

Another proposed amendment to the Act would repeal the power of the Minister to acquire compulsorily medical equipment privately owned, and also professional premises.

LOCAL-AUTHORITY SCHEMES

Dr. SUTHERLAND accepted reference back to council of a recommendation that the Minister should either accept schemes submitted by local authorities under section 20 or else refer them back, and should not substitute his own scheme. Dr. J. A. PRIDHAM (Dorset) pointed out that a local authority might make certain orders in respect of a health centre which the profession did not like; and the profession would then be glad if the Minister, with whom they had discussed health-centre regulations centrally, altered them. Dr. F. A. BELAM (Guildford) felt that it was not for the Minister to impose on a local authority a scheme which it could not afford and did not want.

CERTIFICATES

An amendment by Greenwich and Deptford that there should be a reference to the furnishing free of charge of certificates "required by statute only" brought a reminder from Dr. J. C. ARTHUR (Gateshead) that the profession now had an agreed list of certificates. If Parliament were given power to decide what certificates should be demanded free, there would be pressure from trade unions and employers' organisations for further certificates. The amendment was withdrawn.

COMPOSITION OF HOSPITAL AUTHORITIES

After discussion the meeting approved the recommendations that hospital management committees, regional hospital boards, and boards of governors of teaching hospitals should be democratically elected, with not less than one-fifth of the members elected by the medical staffs, and the chairman elected by the members.

Dr. SUTHERLAND said that the present method of nomination from above downwards should be replaced by the method of going from below upwards. A guide to this procedure was to be found in the local executive councils, which were largely elected. The medical membership of one-fifth, although small, should be sufficient by its quality. The recommendation did not lay down how the lay representatives should be chosen, but if the medical profession got its representation by a democratic process there was no reason why lay people should not elect their representatives also.

North Glamorgan and Brecon wanted regional boards abolished altogether and power vested in hospital management committees. Dr. H. F. MOFFIT said that regional boards were too unwieldy and expensive; remote control had been tried and found wanting.

Mr. A. LAWRENCE ABEL (Marylebone) claimed that here was a chance for the Government to economise by giving a lot of people the axe. "We are told that the quality of people who serve on hospital management committees is steadily dropping because these people feel that they are futile under the present set-up."

Mr. A. STAVELEY GOUGH (West Herts) maintained that much of the sense of frustration with regional boards was due to Ministerial control. There must be a body to plan, at a regional level, the distribution of funds. Without this supervisory body there would just be the Ministry—and a greater dictatorship.

Mr. H. H. LANGSTON (Winchester) said that although they wanted a smaller region in his area they did not oppose regional boards. There must be regionalisation, or there would be inequalities. Consultants working under hospital management committees would have greater cause for dissatisfaction.

Dr. T. ROWLAND HILL (council) described the regional board as a valuable cushion between the Ministry and the hospital management committee, which was dominated so easily.

Dr. A. SMITH (Lanarkshire) suggested that regional hospital boards should control the consultant service and general policy, but that the administration of hospitals should be handed over to management committees, provided that these were reduced in number to cover larger areas.

The amendment was lost.

Dr. D. BROWN (Liverpool) opposed "democratic election" to hospital boards and committees. "If we have democratic election by lay people," he said, "we shall get the old local-authority control or the old board of guardians." If they wished to push the hospital service back into the hand of petty party politics they should pass the recommendation.

Dr. BARBARA WOODHOUSE (Harrow) said that they all preferred to elect their medical representatives. Ought not the meeting to see fair play and demand that those who represented the patients were democratically elected?

Mr. STAVELEY GOUGH said that a regional board should in the main be a planning committee. "If it is to be a planning committee it must be an expert committee, and you do not get that with democratic election."

The recommendation as to the constitution of regional hospital boards was carried as amended. It was agreed that not less than one-fifth of the total membership of hospital management committees should consist of representatives of the medical staffs of the hospitals, and that in addition there should be at least 1 member with experience in the mental health services, 1 public-health medical officer, and 1 medical practitioner in active general practice.

OTHER PROPOSALS ACCEPTED

The meeting adopted the recommendation that a scheme of block grants, paid to hospital management committees, should be devised for hospital finance, with amounts for capital and maintenance to cover as long a period as possible, surpluses being carried over from year to year. It was agreed that medical advisory committees should be elected by medical staff committees and be given statutory recognition, as should the medical staff committees themselves. It was also decided that local authorities should be made to exercise their power under section 19 (3), of coöpting on statutory health committees not fewer than two medical practitioners representing the local medical profession and selected from among those nominated by the local medical committees.

REMUNERATION OF GENERAL PRACTITIONERS

Several members spoke in favour of consideration being given to other methods of payment than the capitation-fee. It was agreed that the remuneration for general medical services should, with certain exceptions to be agreed with the representatives of the medical profession, be by capitation-fee, item-of-service, or other method agreed on and not by fixed salary, except with consent of the profession; and that this arrangement should not be varied except by amendment of the Act preceded by proper consultation with the profession.

The meeting referred to council a motion by Dr. L. B. PALING (South Staffs) that the method of remunerating the general practitioner should be related to the work done, so as to provide an incentive to better work.

DRUGS AND APPLIANCES

Proposing the council's recommendation that persons obtaining their medical care privately should be able to obtain drugs and appliances on the same terms as National Health Service patients, Dr. SUTHERLAND said that the original white-paper led them to believe that all members of the public would be able to take part or all of the service.

Reference back to council was moved by Dr. E. SLADEN (Portsmouth), who said that while there might be a case for free supply of essential drugs in this way, it was different with appliances. "Why should the rich lady who can afford to pay a consultant get her corsets free?"

Dr. A. F. DUNN CARRIE (Manchester) asked who was going to check on over-prescribing. This point was met by the meeting declaring, on the motion of Dr. N. S. BARNETT (Liverpool), that doctors providing private patients with drugs or appliances under the N.H.S. should be subject to the normal discipline.

The original recommendation was carried, with two additions of which one, from Greenwich and Deptford, covered "any other hospital services including pathology, X rays, and physiotherapy"; and the other, by Leicestershire and Rutland, the provision of spectacles.

DISCIPLINARY ARRANGEMENTS

Derby sought to refer back a recommendation that the regulations should be extended to provide disciplinary arrangements for patients. The reference back was lost, Dr. SUTHERLAND saying: "There are sanctions against doctors: we want some sanctions against patients. We have not come with any suggestions as to scheduled fines and imprisonment. That will come when the Minister accepts the principle and we get down to a working party on the subject."

Dr. R. D. MILFORD (South Essex) felt that any suggestion which introduced disciplinary sanctions against the patient was extremely bad for fostering a good doctor-patient relationship. It was better to draw up a code of conduct which could be brought to the attention of patients. His division was opposed to penalties. In the end the doctor had the final solution—he could remove the patient from his list.

Dr. SUTHERLAND accepted, in place of the recommendation by the amending Acts committee that "new and more stringent rules be formulated," an amendment from South Essex "that the Minister and the association should draw up a code of conduct for patients, and that the Minister should take determined steps to bring it to the notice of every patient at regular intervals." He asked if this could not be regarded as a sort of highway code which a patient would have to read before he got his card. It would obviate misunderstanding, and the sanctions sought by the Representative Body might never be needed.

PAYMENTS IN HOSPITAL

Mr. ABEL said that in 1949–50 £2½ million was obtained from pay beds and £136,000 from amenity

beds; this meant that the private bed was paid for to the tune of £6 10s. a week, yet many were charged 15–28 guineas. For amenity beds they were supposed to charge £2 a week, yet they only got back 10s. "Here is a place where we can not only restore practice for private patients but the status of doctors—and make a lot of money for the country."

Dr. SUTHERLAND said that about one-third of the amenity beds came out of the total number of private beds, and medical-need beds also came out of this number. If there was adequate pay-bed accommodation and a grant-in-aid available for persons using private beds, persons of modest income would be able to get the privacy which they required, and the need for amenity beds would ultimately go.

Dr. A. BARKER (East Kent) thought that amenity beds should not be abolished out of hand, and he was supported by a number of other speakers. Dr. ENID HUGHES (Denbigh and West Flint) remarked that it was inconsistent to ask, as the meeting had done, for free drugs for private patients, and also ask for the abolition of amenity beds.

On the other side, speakers developed the view that amenity beds prejudiced private beds. Dr. A. C. E. BREACH (Bromley) claimed that in large parts of the country amenity beds had become a "political racket." There should be a generous supply of medical-need beds. Private beds should be retained, but that was not to say that for snobbish reasons there should be retained cheap private beds.

With acclamation, however, the meeting passed the East Kent amendment that the whole problem of amenity beds required fuller consideration. It approved the remainder of the council's recommendation—that, to preserve adequate facilities for private patients, the Minister should set aside adequate pay-bed accommodation in all hospitals where a need could be shown, that the charges for hospital maintenance should "be reduced to a reasonable level," and that the right of a patient to receive free hospital accommodation be recognised by allowing him in effect a grant-in-aid for a private bed. A rider from Kensington and Hammersmith made it clear that a grant-in-aid should also be made available to persons in private hospitals or nursing-homes.

PARTNERS AND ASSISTANTS

Reading secured a motion instructing the council to explore ways by which a principal might be financially encouraged to take a partner rather than continue with an assistant.

FURTHER WORK

It was made clear that the amending Acts committee is considering further matters, upon which it will report, and that special consideration is being given to the position under the Scottish Acts.

JOINT TRAINING IN HOSPITAL AND GENERAL PRACTICE

IN Scotland the Northern Regional Hospital Board, in collaboration with the executive council for the County of Inverness, are initiating a "joint training scheme in hospital and general practice" which will provide a combined training of about two years' duration for young doctors intending to enter general practice or a specialty. Concurrent experience in hospital and general practice will be given in the hospitals at Inverness and with general practitioners in the town and surrounding district.

Applications are invited for about five posts of senior house-officer (non-resident) with salary at £670 per annum. Training in general practice will be given by five practitioners and is intended to provide representative experience of town and country practice. During his training the young doctor will be attached to two or more of these practitioners to widen his experience. On the first appointment he may be attached to a practitioner for full-time training for 2–4 weeks, and thereafter he will be required to work under the practitioner's supervision for 3–4 half-days per week or a corresponding number of full days. During the second half of the third year the amount of experience in general practice will be increased if he so desires.

Training will be given at the following hospitals:

	Beds
Royal Northern Infirmary (general)	222
Raigmore Hospital (general and maternity)	400
Culduthel Hospital (tuberculosis and infectious diseases)	104
Muirfield Hospital (chronic sick)	57
Craig Dunain Hospital (mental and psychoneurosis) ..	930

The departments will provide training in general medicine and pædiatrics, general and orthopædic surgery, midwifery, gynæcology, diseases of the ear, nose, and throat, ophthalmology, tuberculosis and infectious diseases, dermatology, anæsthetics, chronic sick, psychiatric disorders, and psychoneurosis. Each trainee will be expected to conform to basic arrangements in training in the various departments in rotation, including both ward work and attendance at outpatient departments. Training in surgery will be confined to its diagnostic aspects, especially in emergencies. Trainees will be expected to study for a higher qualification.

HOSPITAL DEVELOPMENT

PRESIDING over the general council of King Edward's Hospital Fund for London on Dec. 14, H.R.H. the DUKE of GLOUCESTER said that the Fund had had to reinterpret its ideas of how best to help the hospitals.

"We are only now realising how great are the changes that have come over the hospital scene in London in the last decade, quite apart from nationalisation. These changes have occurred in accordance with plan, but without attracting a great deal of attention; and only those who have been in intimate contact with hospitals in the last year or two are fully awake to what is happening. It is possible that we shall soon begin to see quite unexpected shifts in the emphasis of hospital work."

He went on to speak of the need to find the right sort of home for those who no longer need to be in hospital and especially for those who are getting on in years. Three years ago, he said, the Fund allocated £250,000 to provide a number of houses with gardens and other homely features to which the hospitals could send suitable cases.

"With this money we are providing nine such houses or homes. Since then the need has become more obvious still and the council is now being asked to provide an additional £100,000 to enable the Fund to buy and equip three more homes and make twelve in all, as was originally hoped. We are also, as an experiment, financing a small office in the Woolwich area which is coördinating the activities of the different agencies caring for old and infirm people and thereby freeing many hospital beds."

He concluded by speaking of the work of the School of Hospital Catering, opened at St. Pancras in September, of the Hospital Administrative Staff College, of the Staff College for Nurses, and of the Nursing Recruitment Service.

Sir EDWARD PEACOCK reported that the ordinary expenditure (including grants) had amounted to £290,000, besides £57,000 on capital and non-recurring items. The increasing part played by Governments in social services had raised acutely the question of the relation between the State and voluntary effort, and the Fund had financed an inquiry by the National Council of Social Service into the hospital side of this problem. A group headed by Mr. John Trevelyan had produced a report, entitled *Voluntary Service and the State*, which would be published in January.

It was resolved that, as last year, sums amounting to £180,000 should be placed at the disposal of the committees for making grants to hospitals and convalescent homes during 1952.

Sir ERNEST POOLEY said that in the Division of Hospital Facilities much work had been done on the investigation on hospital costing.

It had been found recently that among the patients in chronic and geriatric wards there were many elderly nurses who had given long years of service to the London hospitals and were now homeless and infirm. The Fund had been fortunate in finding a pleasant Queen Anne house at Hayes Common in Kent where a gracious way of living could be provided for these old ladies. The coöperation of the London Hospital in running the home had been gained, so that there was the necessary link with a hospital and its medical staff. It was hoped that the home would be opened early next summer and that it would be able to take nurse patients from hospitals in all four Metropolitan regions.

Sir HENRY TIDY said that when the Convalescent Homes Committee began work in 1946 they found the convalescent homes in great need of modernisation, and calculated that it would take about four years to bring them up to date. The council first granted £20,000 and increased this to £100,000 in 1949 and £80,000 in 1950, by which time a great deal of modernisation had been completed. They had £30,000 for 1951 and had just managed to keep within this amount.

The principle of the committee in the past had been to give a considerable amount of capital money required on assurances from the home that they could pay for maintenance. That principle had been upset by the 1951 rise in prices and they would be faced with requests for grants towards deficiencies in maintenance. One group of homes were in difficult circumstances—homes for the very young people from birth to two and birth to five for which there were very few convalescent homes. These homes were important but hard to run, being very expensive and requiring large staffs. It was very difficult to persuade authorities that small children were more expensive to provide for than older ones, but there was no doubt that the running of these homes was going to be a difficult matter in the future.

Medicine and the Law

CARDIAC ACTION AFTER "DEATH" BY HANGING

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MUCH has been written about the cause of death in judicial, suicidal, and accidental hanging. Early researches suggested that death from suicidal hanging was quicker than death by judicial hanging, and Destriveaux and Ansiaux (1821) concluded that it was "une chose naturelle que les individus qui se donnent la mort par suspension périssent plus promptement que ceux que l'on attache au gibet." As the investigations of the Rev. Samuel Haughton (1866), Colonel John de Zouche Marshall (1888), and Prof. F. Wood Jones (1931) have shown, the procedure employed in judicial hanging has been, and maybe still is, an uncertain means of causing instantaneous death.

SOME REPORTED RECOVERIES

Recovery after suicidal or judicial hanging has often been recorded.

In the *Annals of the Barber-Surgeons* (p. 320) is the following extract from *Stow's Annales* (1592, p. 1261): "The 20 of Februarie, a strange thing happened a man hanged for felonie at Saint Thomas Wateringes, being begged by the Chirurgions of London, to have made of him an Anatomie, after hee was dead to all mens thinking, cut downe, stripped of his apparell, laid naked in a chest, throwne into a carre, and so brought from the place of execution through the Borough of Southwarke over the bridge and through the Citie of London to the Chirurgions Hall nere unto Cripelgate: The chest being there opened, and the weather extreeme cold hee was found to be alive, and lived till the three and twentie of Februarie, and then died."

Plot (1677) records that on Dec. 14, 1650, a woman was hanged for half an hour at Oxford Jail and then taken to a private house where Sir William Petty, professor of anatomy at the university, Dr. Wallis, and Dr. Clarke, president of Magdalen and vice-chancellor of the university, had arranged to make a dissection. Perceiving signs of life, they administered cordials and the woman lived for a further nine years, during which time she married and had three children. In 1658, a female servant was hanged in the same town "for an unusually long time" but revived, only to be hanged again the next day.

On Dec. 24, 1705, a man was hanged at Tyburn, but after about fifteen minutes a reprieve arrived: "Hereupon the malefactor was cut down, and being conveyed to a house in the neighbourhood, he soon recovered in consequence of bleeding, and other proper applications." In 1728, a woman was hanged in Edinburgh and her body was taken away by relatives in a cart. The jolting of the vehicle over the rough roads was apparently sufficient stimulus to restore her, and by the time it had gone about six miles she was "almost well." She was still living in 1753.

Great consternation prevailed at the Barber-Surgeons Hall on Nov. 23, 1740, in consequence of a criminal who had been hanged at Tyburn having revived when brought there for dissection. The account given in the *Annals of the Barber-Surgeons* (p. 359) says that he "was carryed to Tyburne in order to be executed where having hung some time was cutt down and brought to this Company's Hall in order to be dissected where he had not been five minutes before Life appeared in him and being let blood and other means used for his recovery in less than two hours he sat upright and drank some warm wine and look'd often round him. . . . He afterwards obtained a reprieve in order to be transported for life which he was accordingly in the 16th year of his age."

In 1858, a man was hanged at Boston, Mass., for 25 minutes. An hour and a half later, pulsation was noticed in the right subclavian artery and heart-beats could be heard at the rate of 80 a minute. The thorax was opened and the right auricle was seen to contract and dilate strongly and regularly. Two hours after the hanging, the number of pulsations were 40 a minute and these gradually decreased until, a little more than three hours later, they ceased altogether. Some criticism has been made of the procedure here, for the dissection was made on a man still obviously alive.

Destriveaux and Ansiaux mention a man who was hanged at Brussels: "et il était resté plusieurs heures attaché au gibet, lorsqu'on le transporta dans un lieur destiné à la dissection des cadavres; il donna des signes de vie, on le secourut avec diligence et il vécut encore trois ou quatre jours; il est évident que les vertèbres n'étaient point luxées et que la second été soutenue par la corde."

In early days there was some doubt as to the correct procedure after recovery from judicial hanging, some authorities maintaining that as the sentence was "to be hanged by the neck until you are dead," a second attempt was obligatory if the first was unsuccessful. The notorious pirates, Captain Kidd (hanged at Execution Dock, May 23, 1701) and John Gow (hanged at Execution Dock, Aug. 11, 1729) had each to be hanged twice, because the rope broke at the first attempt. According to Scottish law a person against whom the judgment of the court has been executed can suffer no more in future, but is thenceforward totally exculpated. The Company of Barber-Surgeons, after the revival of the body brought to their hall in 1587, agreed:

"That yf any bodies wch shall at anie tyme hereafter happen to be brought to or Hall for the intent to be wrought uppon by Thanatomistes of or Companie shall revyve or come to lyfe agayne as of late hathe ben seene, The charges aboute the same bodie so revivinge shalbe borne levied and systeyned by such pson or psons who shall so happen to bringe home the Bodie. And further shall abide suche order of ffyne as this Howse shall Awarde."

Numerous instances are to be found of cases of suicidal hanging in which recovery has been possible, although frequently not for long periods. The following extract is taken from Francis Bacon's *History of Life and Death* (1650):

"I remember to have heard of a certain Gentleman, that would needs make triall in curiosity, what men did feele that were hanged; So he fastened the Cord about his Neck, raising himselfe upon a stoole, and then letting himselfe fall; thinking it should be in his power to recover the stoole at his pleasure, which he failed in; but was helped by a friend then present. Hee was asked afterward, what he felt? He said, He felt no paine; but first, he thought he saw before his eyes a great fire, and burning: Then he thought he saw all Black and darke; Lastly, it turned to a pale blew, or Sea-water Greene; which colour is also often seen by them which fall into Swoonings. I have heard also of a Physician, yet living, who recovered a man to life which had hanged himselfe; and had hanged half an houre, by Fricatious, and hot Baths: and the same Physician did professe, that he made no doubt to recover any man, that had hanged so long, so his Neck were not broken with the first Swing."

Bishop (1801) mentions such a case where the victim, a butcher, lived for only 21 hours afterwards. Shearman (1843–44) reported a similar case which he treated by bleeding from the arm; though the man was apparently lifeless, he recovered, but he died next day. This account gave rise to some discussion, for the treatment was much criticised and it was said that Dr. Shearman bled the man to death. Bree (1843–44), however, in his defence, urged that bleeding was of great importance in the treatment, for it tended to draw the blood away from the engorged vessels, thus encouraging the circulation again through the system. He gives details of a case in which he succeeded in effecting a complete recovery by this method. Both Taylor (1880) and White (1884) were successful in resuscitating persons who were apparently dead as a result of suicidal hanging.

From these accounts it is evident that in the 18th and early 19th centuries the mechanical arrangements for judicial hanging were entirely inadequate. It was quite usual for weights to be affixed to the feet, or for relatives or the hangman to pull on the body or jerk it up and down to hasten the execution. Because of the numerous instances of recovery after hanging and as a humanitarian measure, the "long drop" was introduced in 1874. Previously, death in many cases had resulted from long-continued asphyxiation, and the new method was supposed to result in luxation or fracture of the vertebræ.

SIGNS OF DEATH

The fact that many of the recoveries occurred when the body was apparently lifeless leads to the question of what are the signs of death.

Bouchut (1883), in his earlier work, stated emphatically that all other signs of death may be present—absence of respiration, blueness, and glazing of the eyes—but if the heart is still beating, death has not occurred:

"C'est en vain qu'on chercherait dans la science un seul fait capable d'établir la possibilité de la persistance de la vie, après la cessation des battements du coeur à l'oreille. . . . Les battements du coeur, en particulier, restent toujours appréciables à l'auscultation, et ils ne s'interrompent qu'à l'instant de la mort. Ils sont plus faibles, plus rares, plus difficiles à entendre que dans l'état normal, à cause de leur redoublement, mais ils existent."

It may be, of course, that Bouchut implied that when the heart stops beating and no efforts at resuscitation are made, then there is no hope of recovery; for in a later work he modifies his earlier views:

"Nul état morbide, chez l'homme ou chez les animaux les plus élevés dans l'échelle, n'a donc la poussance de suspendres les mouvements du coeur. Leur interruption est impossible et au dela de dix à vingt minutes, elle doit être considerée comme le signe de leur cessation définitive. L'absence prolongée des battements du coeur à l'auscultation devient de cette maniere, un signe immédiat et certain de la mort."

Parrot (1860) likewise thought that there may be an appreciable interval during which the heart-beats are absent and yet recovery is possible. Also he wrote:

"Evidemment, pour que cette proposition doctrinale put résister aux faits contradictoires qu'on lui oppose, il faudrait que l'intervalle maximum après lequel ces battements et ces bruits ne pouvent plus revenir eût été déterminé par des expériences nombreuses."

The length of this interval was found to vary. Girbal observed that a young girl revived, although auscultation during one or two minutes did not reveal any beating of the heart, and in another case recorded by Brachet (1849), the patient recovered after eight minutes in which no heart-beat was observed. A modern textbook (*Taylor's Principles and Practice of Medical Jurisprudence* 1948) states that "life is therefore not incompatible with a temporary suspension of heart-beat, but it is undeniable that the function must be speedily re-established, or death is certain."

WILLIAM CLIFT'S DIARIES

The cases so far quoted are but a few of the recorded instances of recovery after apparent death by hanging. The following are cases of criminals whose bodies were directed to be dissected after judicial hanging and therefore no attempt was made at resuscitation. Accounts of the dissection of 36 such bodies have been consulted, and it seems that in 10 of these the heart was still beating when the body was received. The dissections were made and recorded by William Clift, first conservator of the museum of the Royal College of Surgeons.

May 12, 1812

A man about 42 years of age was hanged at 8 A.M. and the body was received at 9.15 A.M. "The right auricle of the heart moved at irregular intervals without the application of any stimulus during the period of nearly four hours from the time of execution; and for about an hour longer upon being touched with a scalpel. This motion was not strictly a contractile action, diminishing in any sensible degree the cavity of the auricle. It was undulatory and weak, sometimes beginning at the right extremity of the auricle and moving to the left; at other times commencing and proceeding in the contrary direction. Not the least motion was observable in the left auricle or in either of the ventricles."

Jan. 4, 1813

A man aged about 60, hanged at Execution Dock. It was observed "that the right auricle of the heart, upon being touched with a scalpel, went into weak wavering motions to the period of about five hours from the execution . . . that not any motion could be excited in the left auricle or in either of the ventricles."

Sept. 20, 1813

Two men hanged at Newgate at 8 A.M. Bodies dissected soon after 10 A.M.

1. "The right auricle contracted spontaneously until a few minutes before 12 . . . and . . . by stimulation until a little after 2 o'clock. Aged about 44 years. No fluid in the cavity of the chest. The pericardium contained about an ounce of fluid."

2. "The right auricle showed spontaneous movements at intervals of from 3 to 5 minutes until near 12 . . . and by stimulation until 10 min. past 3. About 6 drams of fluid in pericardium. Not any in thorax. Aged about 40."

Jan. 24, 1814

A man aged about 29, hanged at Execution Dock. "The body was received at half-past 12. About three drams of fluid in pericardium. No motion was perceivable in either ventricle or in the auricle of the left side, but in that of the right very evident contractions took place, beginning at the apex of the auricle and proceeding regularly towards its base. These contractions became gradually weaker till about half past 2 when they intirely ceased. In the early part of the examination it was necessary to stimulate the auricle. In doing this, a small puncture was made into its cavity by which a considerable quantity of blood issued so that from the flaccid state of the auricle the contractions were not so distinct as they otherwise would have been and made it necessary to compress the heart from time to time and make the auricle turgid in order to observe the contractions."

Sept. 19, 1814

Two men hanged at Newgate at 8 A.M. The bodies were received about 9.20 A.M.

1. Man aged about 50. "Ten minutes before 10 the body was opened. No fluid in the thorax. Ligatures were tied round all the large arteries and veins. No spontaneous contraction in the right auricle and when produced by stimulus was only weakly from the first. At half past 10 the contractions apparently as at the first. At 12 they were hardly perceptible. At 20 minutes past 12 they had intirely ceased."

2. Man aged about 30. "No fluid in thorax; about 3 drams in pericardium. The large blood vessels were not secured by ligature. The contractions of the right auricle were remarkably strong till 12 o'clock and were afterwards continued by occasional stimulus. At half past 1, after the heart had been allowed to remain quiet twenty minutes, 23 successive contractions were produced by one stimulation of the auricle by the fingers. Five minutes after this, five contractions only were produced from an equal stimulation. These contractions continued but became gradually weaker till 10 minutes before two when they intirely ceased; the surface of the auricle having become dry from so long exposure."

May 15, 1815

A man aged 29, hanged at Newgate at 8 A.M. "The body was received at 20 minutes past nine. At 40 minutes past nine the cavity of the thorax was opened. Not any fluid in the cavity. No motion of the heart was perceivable through the pericardium or to be felt by the hand. The pericardium was then laid open; about half an ounce of nearly colourless fluid was found in the cavity. At 5 minutes past 10 the first action of the right auricle was perceived proceeding from the base to the apex. At 30 minutes past 10 the heart and lungs were detached from the body, after having made double ligatures upon the venæ cavæ and aorta. At this time the right auricle was turgid with blood and acting spontaneously at about one minute interval (at least no other stimulus had been applied than the disturbance of the heart in applying the ligatures to the large blood vessels). At 40 minutes past 10 the heart and lungs were placed upon a dry towel. At 11, the spontaneous action of the right auricle at about a minute and a half intervals and then remained at rest till at 5 min. past 11, a similar contraction. At 10 min. past, a ditto, at 15 min. past, a ditto but weaker. 22 min. past no more spontaneous action but was produced nearly as strong as before on gently touching the auricle with the fingers. Two contractions were produced by one application of stimulus. 30 min. past 11, very slight action and that not repeated from one stimulation. 35 min. past 11 o'clock, very slight action and only one from one stimulation. 40 min. past 11 o'clock, having intirely ceased to act, the heart and lungs were immersed in water heated to about 100 degrees but no motion whatever was produced by the immersion nor by any future application of stimulus."

Sept. 17, 1827

A woman aged 41, hanged at the Old Bailey. "Sir William Blizard directed the thorax to be opened as quickly as possible after the body was received; soon after nine o'clock. No blood in the right side of the heart and a very small quantity in the left. The heart continued to contract on the application of stimulus an hour and a half after she was cut down, even long after the heart was removed from the body, placed in a saucer and quite cold, the appendix of the right auricle especially."

Sept. 20, 1830

A man hanged at the Debtor's Door of Newgate. "The body was received about quarter past nine o'clock. As soon as the body was stripped and the cord removed, a very visible twitching or tremulous motion was observable of the platysma myoides on each side, particularly on the left side which continued until an incision was made through the integuments when it instantly ceased. A crucial incision was made by Sir William Blizard from the upper part of the sternum to the umbilicus, and from the outer margin of the pectoral muscle of one side to that on the other. The cartilages of the ribs at both extremities on the left side being divided and the portions raised, the heart was exposed and pericardium opened. Not any motion was perceptible in either ventricle even on their being pricked with the point of a scalpel. The appendix to the right auricle was observed to be strongly in action and continued for about 2 hours, until the parts were closed by suture. These contractions in the appendix to the right auricle were at first continued apparently circularly round the upper part of the appendix from the right towards the left, and descended towards the base. After about 20 minutes, this motion was reversed and proceeded from the base below, up the left edge or side and back on the upper edge of the appendix towards the right as if produced by a circular current. These contractions became gradually weaker and ceased about 10 o'clock, but might be excited after that time by stroking the appendix with the finger."

The accounts of the above 10 cases are taken from William Clift's manuscript diaries and notes, in the possession of the Library of the Royal College of Surgeons of England.

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Covenant against Competition from Retiring Partner

In Whitehill and others *v.* Bradford, reported in the *Times* of Dec. 14, the Court of Appeal has instructively reviewed the covenant, familiar in medical-partnership agreements, which prevents a retiring partner from practising in possible competition with his former colleagues. Mr. Justice Danckwerts in the court below had granted an injunction so as to enforce the covenant.[1] The Court of Appeal has now upheld his decision.

Covenants in restraint of trade can, if unreasonable, be declared void as being contrary to public policy. The particular covenant over which the litigation arose prohibited a retiring and outgoing partner from "directly or indirectly carrying on or being interested or concerned in carrying on the business or profession of medicine, surgery, midwifery or pharmacy" within a ten-mile radius for a period of 21 years from the date of retirement. Three elements were challenged as unreasonable—the width and uncertainty of the formula, the area of restriction, and the length of the period.

At the outset of his judgment the Master of the Rolls observed that the court, in deciding the reasonableness of a restrictive covenant, could not ignore the facts, which in the case now before the court were that there was a mutual agreement between four professional men, separately advised, and that its purpose was to protect the continuing partners against competition on the part of one of their number who retired. The language of the formula ("directly or indirectly carrying on," &c.) did not have so wide an effect between professional men as it might have where it purported to restrain the business of a limited company; it did not carry the covenant beyond what was reasonably required for protecting continuing and remaining partners from competition.

There was nothing vicious, said the Master of the Rolls, in the 21-year period; a duly qualified medical practitioner was "a relatively mobile person" and the whole of the United Kingdom was open to him. A for the ten-mile radius and the contention that a five mile radius would have been evidence to show that 99% of the patients lived within five miles, and that there were some small townships within five miles in that part of Warwickshire while there were very considerable townships (such as Nuneaton and Tamworth) between five and ten miles away. The number of patients was not the only point. At the material date when the partnership agreement

1. See *Lancet*, Nov. 10, 1951, p. 881.

was signed, the proportionately small number of patients on the periphery had included the more affluent ones who could come by car to the principal surgery; they accounted for one-third of the income of the practice. If all these points were added together—the width of the language, the length of the period, and the extent of the radius—the total result did not produce anything unreasonably wide.

There remained the question of the impact of the National Health Service Acts of 1946 and 1949. It was clear that doctors who served in that service could no longer sell the goodwill of their practices. All of these four doctors were "listed." That prohibition, however, did not have the effect of destroying the goodwill or of vesting it in the State. Goodwill still remained one of the assets of the partnership even if it could not be sold. The partners' livelihood still largely depended on the goodwill which they had created and on the extent to which they could preserve it.

The Court of Appeal held that the covenant was good and enforceable. The retiring partner's appeal against Mr. Justice Danckwerts's order was dismissed, but the injunction was suspended until the end of the present year.

Public Health

Leisure for the Housewife

Dr. J. Haworth Hilditch, medical officer of health for Wigan, remarks in his report for 1950 that much has been done by social legislation to improve the lot of various groups; but "the individual who gets little direct help from the new legislation is the ordinary working housewife."

"She works long hours and unless she is well blessed with kindly relatives she gets little respite from the constant company of her pre-school children. Little is done to provide coöperative facilities for shopping, laundering or 'baby watching' and in order to gain some relaxation the parents are often obliged to seek their pleasures separately. This has a disastrous effect on morale and is often the first step to a more serious break in family relationships. It should not be difficult for one or more of the many voluntary bodies which now exist to organise local 'care clubs' to help with the problems outlined and to regenerate that atmosphere of neighbourliness which is fast disappearing from urban life."

Poliomyelitis in Glasgow

In his report for 1950 Dr. Stuart Laidlaw, medical officer of health for Glasgow, records that during the year 278 confirmed cases of poliomyelitis were notified among residents in the city. Of these cases, 212 were paralytic and 66 non-paralytic. Deaths numbered 11.

In the 117 cases where poliomyelitis was notified and the diagnosis was subsequently altered, the final diagnoses were most commonly as follows:

	No. of cases
Tonsillitis	14
Upper respiratory infections	12
Bronchitis, pneumonia, tuberculosis	10
Infections of the central nervous system	11
Hysteria	3
Acute rheumatism (myositis, fibrositis)	7
Other infectious diseases (scarlet fever, leptospirosis, dysentery, whooping-cough)	11
No apparent disease	25

Of those who were admitted to hospital as suffering from other diseases and were subsequently found to have poliomyelitis, the original diagnoses had been:

	No. of cases
Cerebrospinal fever	53
Whooping-cough	1
Pneumonia	6
Continued fever	2

With regard to the confirmed cases, the great majority showed little or no traceable connection between one another. On the other hand, the children of employees of some four or five firms each employing 1000–2000 people had a much higher than usual incidence of infection.

In England Now

A Running Commentary by Peripatetic Correspondents

I ENJOYED your peripatetic's account (Oct. 27) of how the tactful domiciliary consultant saves us lesser mortals embarrassment—and after all, are we not, in our humble way, one source of his bread and butter (or oysters and champagne)? It reminded me of a curious dream I had not long ago after failing the Membership with flying colours. My downfall came in the clinical, when Sir Exwhy Zed, the distinguished physician, rejected with scorn my diagnosis of Graves's disease. His look of distaste was in no way relic when I told him I had not found sugar in the urine, adding that I had not, in fact, tested it at all. Having celebrated my certain failure in a becoming manner, I fell that night into the uneasy sleep of one unjustly robbed of well-earned academic success. It was then that I dreamt my dream.

I found myself an earnest general practitioner confronted with a diagnostic problem, for which I had referred the patient to Sir Exwhy Zed, at his Harley Street consulting-room. A little later, so it seemed, I received this letter:

My Dear Dr. Abiesea,—I am indeed grateful to you for sending Mr. Emmen to see me. Your introductory letter was most helpful and your lucid analysis threw much light on this difficult case. I shall not give you his history in full as it is clearly familiar to you. As you know, his predominant complaints are loss of weight and a constant sense of tiredness. I found your tentative diagnosis of hyperthyroidism a most attractive explanation of this syndrome, especially in view of the fact, which you of course had in mind, that exophthalmos is not an invariable accompaniment of Graves's disease; and the tachycardia one expects in this condition might well have been modified by your admirable sedative therapy.

On consideration, however, I did not see how we could altogether disregard the heavy reduction of Fehling's solution by the urine and the typical diabetic blood-sugar curve. I feel, therefore, that despite the undoubted presence of a hyperthyroid tendency in this case, as you so ably pointed out, we should devote our attention primarily to correcting the patient's disordered carbohydrate metabolism. To that end, I am venturing to enclose a diet sheet and a few notes on an insulin dosage that you may think appropriate.

Yours very sincerely, *Exwhy Zed.*

I have not yet succeeded in drawing any moral from this peculiar dream.

* * *

A stay in hospital gives one a novel slant on what psychiatrists call our "body-image." In the ordinary way I am constantly made aware of my over-average height by the olde-worlde rafters, electric-light fixtures, and suchlike hazards placed in my path by lesser men. My first air-trip (in a somewhat bijou flying-boat) was chiefly memorable for the resounding collision between my skull and a prominent cross-beam in the ceiling.

The ambulance men who brought me here tried hard to close the doors of their vehicle with me in situ. "Cor!" exclaimed one, "'E is a long 'un, ain't 'e, Bert." Since then both nurses and medical staff have been diverted from their immediate concerns by the sight of my heels pressed firmly against the foot-rail of my bed while my occiput grazes the head-rail. Radiographers, physiotherapists, and others, when applying their equipment to my attenuated frame, make no secret of their difficulties. Luckily none of them is a disciple of the legendary Procrustes, that pioneer of standardisation. I am daily reminded of that poignant little ditty *en forme de calypso*, rendered by Edmundo Ros and his boys on the radio: "His feet too long for de bed" (repeated *ad lib.*).

It was, I believe, H. L. Mencken who complained that while Freemasons, Elks, Knights of Pythias, military dignitaries, and other favoured groups could demand a special ritual of burial, no service was officially ordained for the damned, in which he claimed a personal interest. On much the same lines, I would plead for cinemas, theatres, public transport, hospitals, bedsteads, and small cars constructed with an eye to the problems of us outsizers: for whatever their views on human equality at birth, the designers cannot deny our existence in later life—*vide* the advertisements for ladies' ready-made clothing.

Part of the art of living is to seek out our assets buried under apparent liabilities. Years of travel on London's underground railways have made it second nature for me to reach aloft for support whenever my equilibrium is threatened. The upper air of my ward is threaded with a complex system of curtain-rails, enabling a decorous purdah to be organised round one's bed at a second's notice. When promoted to ambulatory status, I soon discovered the possibilities of this arrangement, which fortunately was well within my reach. On her next visit my wife, accustomed to the imaginative play patterns of our two small boys, summed up my performance in these words (unfortunately overheard by one of the nurses): "What's this—playing at trolley-buses?"

* * *

The babu is following the pukka sahib to extinction. The world will be less picturesque for his going, as the following old newspaper advertisements show.

Miracle of Modern Medicine for Diabetes.—Days of miraculous discoveries have not yet passed. T . . . is one of the modern miracles of medicine. It opens up a new chapter in diabetes therapy. It radically eradicates this disorder and its complications like, furuncles, ulcerations, gangrene, cataract, high blood-pressure, etc. THERE ARE NO STRICT RESTRICTIONS IN DIET. . . . Many who are fed up of taking injections of insulin daily have switched to the new oral treatment, . . .

Or there was the simple and direct appeal of this:

What's your disease? Just try Dr. S. C. Walla's 30 years well reputed patent medicines for various diseases and bank the balance.

Some of the claims made were of the widest—for example, a charm prepared by "World Famous the Great Astrologer" was said to have the following action:

It helps to gain success in occupation, to fulfil desire, to get royal honour, to get promotion in service, to attain prosperity in business, to increase wealth, to secure command upon all. By wearing this charm great men of any caste and creed and even the ordinary people have overcome the enemies and have attained success in the most unfavourable and complicated law suits without any difficulty. This is always very good for the welfare of the family men.

Prospective interview and viva victims, please note.

* * *

Say what you like, we who were trained at Guy's Hospital—doctors, nurses, or auxiliaries—carry one life-long advantage over old students of the other medical schools of London. Whether in the seething thoroughfares of Timbuctoo, or the icy wastelands of St. Thomas's Street, S.E.1, if strangers ask us the origins of our hospital we can name its founder without hesitation; what's more, if given a second or two we may deduce from the bicentenary celebrations of 1925 the date of its foundation. Only when pressed for further details does the old Guy's man (or woman) shuffle uneasily and recall urgent engagements elsewhere. The inquirer who draws the natural conclusion, that we have no more information to give, will be wrong. The fact is that generations of Guy's students have been brought up on vague innuendoes and sly hints regarding the source of Thomas Guy's fortune. That he was some kind of Dirty Dog none of us have doubted; a sly miserly trickster we thought—wasn't he a bookie, or something like that?

All this is intended to explain why there was so serious a need for a well-illustrated history of Guy's Hospital at a price within the reach of students and nurses. At last the need has been met, and brilliantly too. With the bicentenary number of the *Guy's Hospital Gazette* as a basis, a committee, with Dr. Maurice Campbell as chairman and Mr. Hujohn Ripman as editor, has collated an exciting serial story in five parts (as the early cinema put it) replete with colour-plates and nearly a hundred other pictures: and all for 18*s.* 6*d.*—it's a gift.

At last we see Guy in a true light—meeting a huge demand for cheap Bibles, buying sailors' pay-chits, investing the proceeds in South-Sea stock, and selling out at the right moment: a generous financial genius; and for "bookie" read "bookseller."

Letters to the Editor

A COLLEGE OF GENERAL PRACTITIONERS?

SIR,—Your encouraging leading article of Dec. 8 and the many favourable letters in your journal have confirmed our belief that an academic headquarters for general practitioners in this country is really needed. Whether this is to be a College, a Faculty, or an Academy has yet to be decided. If the idea of another college does not prove acceptable to the medical profession as a whole, an Academy of General Practice, connected not only with the three Royal Colleges but also with the Society of Apothecaries and with the Postgraduate Federation, might serve our purpose well. We are in close touch with the American Academy of General Practice in the U.S.A., which has recently had to solve many of the problems we are facing now.

The interest in this subject shown by the Royal Colleges, by the Society of Apothecaries, and by the Postgraduate Federation, and their offers of help and support, have all been most welcome. The suggestion in your leading article that the three Royal Colleges, and they alone, should be responsible for the foundation of a Faculty of General Practice will receive most thorough consideration. This might well be the easiest and the quickest way to start; but we are really concerned with what will help practitioners most in the long run. We ourselves know how truly generous the Royal Colleges would be over the development of a new kind of triple faculty such as this; but it must be remembered that the main interest of the Royal Colleges must always be in their own fellows. For historical and other good reasons we feel that the Society of Apothecaries should be included; and many practitioners think that their headquarters should be closely connected, also, with the Postgraduate Federation. The inclusion of these other two bodies is unlikely to have any appreciable disintegrating influence, which, we agree, should be avoided at all costs.

We propose now to bring together a small steering committee to guide this project through its next stages—a committee composed of the five general practitioners who have been most active in launching it, and five other members to advise us and to report our views to the Royal Colleges, to the Society of Apothecaries, and to the Postgraduate Federation. The practitioners are: G. O. Barber (Essex), J. H. Hunt (London), J. MacLeod (Aberdeenshire), F. M. Rose (Lancashire), and A. Talbot Rogers (Kent). The five other members are: Prof. J. M. Mackintosh, F.R.C.P. (professor of public health, University of London), Sir Heneage Ogilvie, F.R.C.S. (Editor of *The Practitioner*), Mr. John Beattie, F.R.C.O.G., F.R.C.S., Sir Wilson Jameson, F.R.C.P. (Society of Apothecaries), and Prof. Ian Aird, F.R.C.S. (Postgraduate Medical School of London). The Rt. Hon. Henry Willink, K.C. (Master of Magdalene College, Cambridge), has kindly accepted the chairmanship of this committee. If anyone has constructive criticisms to make about this steering committee, will he please communicate with us at once?

Members of the family of the late Dr. Geoffrey Evans have been very generous to us; they have offered us the use of secretarial facilities and committee rooms in 7, Mansfield Street, which will be our temporary home; and they have given us his medical library.

This will be the last of our joint letters. From Jan. 1 correspondence should be addressed to the secretary, the General Practice Steering Committee, 7, Mansfield Street, Portland Place, London, W.1.

99, Fylde Road, Preston, Lancs. F. M. ROSE.

54, Sloane Street, London, S.W.1. J. H. HUNT.

SIR,—Prof. Ian Aird, in his helpful and constructive letter (Dec. 1), states that "it is not difficult to contemplate an examination which, in breadth rather than in depth, would test a general practitioner's high professional competence."

In this context it is interesting to recall that, some years ago, the M.D. degree of Durham University could be obtained in one of three ways: (1) by special examination, similar in scope to the M.R.C.P.; (2) by thesis; or (3) by examination, for practitioners of fifteen years' standing. This last-mentioned method was a broad-based examination, designed primarily for general practitioners, and was unusual in that it was not restricted to graduates of Durham University. It was a well-conceived degree, which fulfilled a definite purpose, but it was choked out of existence by the overgrowth of specialist diplomas in the period between the two wars. If the sponsors of the new college intend to institute an examination, they might with profit peruse the old regulations relating to this degree.

In the past it was possible for able G.P.s to edge their way gradually into a specialty. This road is now most effectively blocked, and it would be an encouragement if some other similar avenue were opened up. Professor Aird's suggestions would lead to this end.

The college might direct the efforts of the embryo G.P. during the year following qualification, which is now spent in hospital as house-surgeon and/or house-physician. It would seem that, if general practice is to be the goal of the new doctor, this first year of post-graduate work could be more usefully placed on a broader base, and not used up entirely in doing two specialised appointments of six months each.

It is unlikely that much research of value will emerge from general practice until health centres have been developed. The college could give advice on the design, method of operation, and scope of such centres, and attempt to speed their development.

Further, we must have our own journal, as those in existence cover far too wide a front for our special purpose. This new journal might reasonably confine itself to the rapid reprinting of articles of special interest to G.P.s, from current literature. Its use as yet another outlet for original articles should not be encouraged.

Finally, in the light of fairly recent events, the new college might be placed in one of the provincial university towns, away from the political influence of the Royal Colleges.

Kidsgrove, Staffs. D. G. FRENCH.

CHARCOT JOINTS IN DIABETIC NEUROPATHY

SIR,—We wish to congratulate Dr. Lister and Mr. Maudsley on their splendid description (Dec. 15) of a case of Charcot joints in a diabetic with neuropathy. We write to point out that this condition is not so rare as they suggest, as we have seen three such cases in the last six months—one a complete replica of their case. Indeed, one of us pointed this out in a recent letter.[1] We have a considerable series of such cases which we hope to publish soon.

Diabetic Department,
King's College Hospital,
London, S.E.5.

R. D. LAWRENCE
WILFRID OAKLEY
M. MENCER MARTIN.

SIR,—A further diabetic lesion, which is not well recognised, appears also to have been present in the case of neurogenic arthropathy reported by Dr. Lister and Mr. Maudsley. Diabetic nocturnal diarrhœa [2] is characterised by frequency and urgency of bowel action amounting at times to nocturnal incontinence. Such symptoms have been observed three times in cases I have examined, and in two full investigation demonstrated no alternative bowel lesion.

Though neurological change is very common in the recorded cases, the symptoms are not necessarily related to variations in the nervous state. Corresponding bowel disturbance does not occur after sympathectomy, and it may be doubtful whether the condition is, in fact, due to abnormality of the autonomic nervous system. Metcalfe [3] has reviewed the physiology of the condition.

Therapeutically, the condition is important since it responds readily to treatment with liver extract—a further point against a neural origin. Liver was, apparently, omitted in the case of Lister and Maudsley before the onset of the bowel complaint.

A new and suggestive finding in the most recent case seen in this hospital has been the control of bowel symptoms of four months' duration with full doses of vitamin B_{12}. This improvement has been maintained for two months.

West Herts Hospital,
Hemel Hempstead, Herts. CEDRIC HIRSON.

*** In the article by Dr. Lister and Mr. Maudsley the patient's age was inadvertently omitted. It was 63 years. —ED. L.

INDUSTRIAL DERMATITIS

SIR,—In his article on industrial dermatitis Dr. Mark Hewitt (Dec. 15) suggests that "For convenience the fiction that the malady is occupational, as originally opined, is accepted by medical boards and appeal tribunals who only deal formally with questions of disablement." May I assure him that medical boards have the duty of forming their own opinion on the evidence before them and certainly do not accept other opinions for convenience or without adequate scrutiny. Nor are their proceedings so formal that full consideration of clinical details is impossible.

Sevenoaks. GORDON WARD.

BOVINE TUBERCULOSIS PREVENTS HUMAN TUBERCULOSIS ?

SIR,—The recent letters of Mr. Pitcher (Oct. 27) and Dr. Nisbet (Dec. 8) focus attention on a possible inverse relationship in certain areas between the incidence of respiratory tuberculosis (human) and that of bovine tuberculosis in dairy herds. This inverse relationship is well brought out in a comparison between the respiratory tuberculosis death-rates over the last number of years in the two separate areas of the County of Ross and Cromarty—namely, the Island of Lewis (pop. 24,000 approx.) where bovine tuberculosis of cattle may be considered to be practically non-existent both now and in the past, and the mainland of Ross (pop. 37,000 approx.) where bovine tuberculosis has been endemic in dairy herds for very many years, although herds are now rapidly being made tubercle-free.

Mortality per 100,000 population (calculated on approx. population)

Year	*Lewis (24,000)*	*Mainland (37,000)*	*Year*	*Lewis (24,000)*	*Mainland (37,000)*
1935	108	35	1943	50	46
1936	54	24	1944	71	65
1937	145	43	1945	96	49
1938	79	57	1946	92	54
1939	108	29	1947	121	54
1940	92	13	1948	162	29
1941	87	57	1949	104	38
1942	83	27	1950	58	11

In spite of other possible factors (such as the late arrival of tuberculosis in Lewis) I feel that the above data clearly point to an inverse relationship between bovine and human infection. Nevertheless, I should hesitate to agree to any slackening in the present endeavour to eradicate tuberculosis from our dairy herds. The obvious action required is that along with schemes of eradication of bovine infection in cattle we should have mass vaccination of children with B.C.G. (until a better vaccine is produced), to counteract the loss of the bovine immunising factor. This action should apply also to city areas, such as Glasgow, where for over a quarter of a century pasteurised milk has been the order of the

1. Oakley, W. *Brit. med. J.* Dec. 8, 1951, p. 1404.
2. Sheridan, E. P., Bailey, C. C. *J. Amer. med. Ass.* 1946, **130**, 632.
3. Metcalfe, W. J. *Manchester Univ. med. Sch. Gaz.* 1949, **28**, 2.

day—and incidentally high respiratory tuberculosis mortality-rates also.

The time is ripe, I believe, to free the use of B.C.G. vaccine from restrictions and to allow those responsible for the prevention of tuberculosis to use it as they consider fit, in the best interests of the area for which they are responsible. Considering the different immunological backgrounds of the populations of the various areas of Britain, I doubt very much if the results of an attempted controlled experiment in the use of this vaccine would be applicable to any area other than that in which the experiment was carried out.

County Public Health Department, Dingwall, Ross-shire. J. LANDESS HORNE.

VARIATIONS IN RESPONSE TO RELAXANT DRUGS

SIR,—Dr. Dundee and Dr. Gray in their interesting article (Dec. 1) state that drugs acting by depolarisation block produce a normal effect in myasthenic patients. The work of Paton and Zaimis [1] in animals has shown that those muscles which are hypersensitive to *d*-tubocurarine chloride are resistant to decamethonium iodide. Consequently, it might be anticipated that the muscles of patients with myasthenia gravis, which are known to be sensitive to *d*-tubocurarine chloride, would in fact be tolerant to decamethonium iodide.

Dr. Dundee and Dr. Gray gave 0·95 mg. decamethonium iodide in divided doses to one patient with myasthenia gravis and noted the effect on the volume of respiration. As there were no signs of sensitivity they concluded that the response of their "myasthenic patient to decamethonium iodide was within the limits of normality." Our findings,[2] based on an investigation of eleven cases of myasthenia gravis, indicate that the peripheral musculature of these patients is resistant to the depolarising action of decamethonium iodide.

H. C. CHURCHILL-DAVIDSON
St. Thomas's Hospital, London, S.E.1. A. T. RICHARDSON.

LYSOGENICITY IN BACTERIOPHAGE STRAINS

SIR,—May I point out a mistake in your annotation of Nov. 24? You state that Bertani's [3] work was accomplished by ultraviolet irradiation. Almost the reverse was true, since he was unable to induce lysis by this method.

Animal Health Trust Livestock Research Station, Houghton, Huntingdonshire. H. WILLIAMS SMITH.

THE TIME OF DEATH

SIR,—At an inquest held on Dec. 11 on a man hanged at Lincoln Gaol, the medical officer of the prison, when asked by the coroner if death was instantaneous, said:

> "I wish to add one thing in explanation of something your predecessor remarked to me. He told me I should not say that a man's death was instantaneous if his heart continued to beat. The man is to all intents and purposes dead the minute his neck is dislocated. He cannot breathe any more, and the loss of consciousness is instantaneous. But the heart does continue to beat for anything up to 20 minutes. It is a purely automatic function and does not mean that that man is alive. I think I should make that clear in view of the observation of your predecessor." [4]

I believe my father, the late Dr. Llewellyn A. Morgan, who was medical officer at the old Newgate Prison between the years 1882 and 1887, was the first to demonstrate the heart-beats following judicial hangings there.

At that time Professor Dudgeon of St. Thomas's Hospital invented an instrument to record the radial pulse, known as Dudgeon's sphygmograph. This little instrument, actuated by a clockwork mechanism, recorded the pulse on a strip of carbon paper, and my father used to dash into the pit immediately after the drop, attach the sphygmograph to the man's wrist, and run off tracings. These tracings showed clearly that the heart stopped for a few seconds immediately after the drop, and then recovered, resuming an apparently normal beat for a period as long as 8 minutes, after which the beats became more and more feeble, finally fading out. The heart would no doubt beat a little longer than would be discernible at the pulse and maybe for as long as 20 minutes. My father's tracings were reproduced in Buchanan's *Medical Jurisprudence and Toxicology*, published, I think, in 1912.

An interesting medicolegal point arises from the coroner's question and the prison medical officer's reply. According to Glaister,[5] "death may be defined as complete and persistent cessation of respiration *and circulation*" (italics mine). Consequently, in the case in question death did not take place until the heart ceased to beat, and the reply, on strictly legal grounds, to the coroner's question would appear to be that while there was instantaneous oblivion, death (i.e., somatic death) took place some minutes after the process of execution.

I am not disputing the appropriateness of the answer of the prison medical officer before a coroner's jury, but the coroner's question is pertinent. There are cases where respiration is arrested—for instance by paralysis of the respiratory centre—in which circulation is unaffected and artificial respiration will reproduce the appearance of life though the patient is in fact "somatically" dead; or is he?

The point at issue is perhaps academic but may have a bearing on the validity of a death certificate signed before a person is legally dead.

Guildhall, London, E.C.2. M. T. MORGAN.

QUICK TESTS

SIR,—In various articles on hæmophilia that Dr. Merskey has recently published, including one written jointly with Dr. Macfarlane and published in THE LANCET,[6] he describes a procedure which he has designated Quick's test for hæmophilia. This method, which I published ten years ago,[7] depends on the effect of differential centrifugation on the clotting-time of recalcified plasma. Until recently the test served as a useful means for diagnosing hæmophilia although it has limitations similar to those of the clotting-time.

If my name is to be attached to a method for the diagnosis of hæmophilia I should prefer that it be to the prothrombin-consumption time,[8] or to a modification of this test [9] in which the prothrombin is determined in the serum obtained from blood to which heated rabbit-brain extract has been added. To avoid the absurdity of calling this Quick's test for hæmophilia no. 3, it has been tentatively designated "the thromboplastinogen-activity time." Irrespective of whether the name meets the approval of the coagulationists, the test appears to be the most promising means for detecting exceedingly mild cases of hæmophilia.

I have devoted much thought and effort to selecting a specific name for every test which I have devised. I did this to obviate its becoming a Quick test. Perhaps I have been over-conscientious. Within a short time, I am sure, the capital "Q" will change to a small "q." Since the prothrombin-time for normal blood is 12 seconds and the prothrombin-consumption time for hæmophilic blood is 8–12 seconds, no-one—not even my severest critics—should find too much objection to having the name Quick attached to these tests, especially since there is the hope that the "Q" will eventually lose its capital status.

Marquette University School of Medicine, Milwaukee, Wisconsin, U.S.A. ARMAND J. QUICK.

1. Paton, W. D. M., Zaimis, E. J. *J. Physiol.* 1951, **112**, 311.
2. *J. Neurol. Neurosurg. Psychiat.* (in the press).
3. Bertani, G. *J. Bact.* 1951, **62**, 293.
4. *Times*, Dec. 12, 1951, p. 3.
5. Glaister, J. Medical Jurisprudence and Toxicology. Edinburgh. 1945.
6. Merskey, C., Macfarlane, R. G. *Lancet*, 1950, **i**, 487.
7. *Amer. J. med. Sci.* 1941, **201**, 469.
8. *Ibid*, 1947, **214**, 212.
9. *J. Lab. clin. Med.* (in the press).

Obituary

FREDERICK MURGATROYD

M.D. Lpool, F.R.C.P., D.T.M. & H.

Professor Murgatroyd came from Liverpool to London in 1937 to join the staff of the Hospital for Tropical Diseases, and last year he was appointed to the Wellcome chair of clinical tropical medicine at the London School of Hygiene. Through his death, on Dec. 16, at the age of 49, and at the top of his powers, tropical medicine has lost one of its most incisive minds.

He graduated M.B. with honours at the University of Liverpool in 1926 and soon afterwards he was persuaded to take up tropical medicine by Warrington Yorke. Murgatroyd used to recall how Yorke, who was a patient in the ward in which Murgatroyd was house-physician, asked what he proposed to do for his career. Murgatroyd replied that he was thinking of taking up neurology. Yorke greeted this reply with some disparaging remarks and offered the challenge that tropical medicine afforded the best scope for an intelligent man. He added an invitation for Murgatroyd to join his department. This was the beginning of an association of the highest value to Murgatroyd.

In 1927 he was appointed lecturer in protozoology at the Liverpool School of Tropical medicine, and the same year he took his D.T.M. & H. Later he became clinical pathologist and, in 1934, lecturer in tropical medicine to the school and assistant physician for tropical diseases at the Liverpool Royal Infirmary. During these years he had been carrying out, with Warrington Yorke, a series of investigations on the mode of action of drugs in sleeping-sickness, and in 1936, as the first senior research fellow in tropical medicine of the Medical Research Council, he was seconded to the Gambia to continue this work in the field.

In 1937 he was appointed lecturer in clinical tropical medicine at the London School of Hygiene and Tropical Medicine. He also became assistant physician at the Hospital for Tropical Diseases, physician with charge of outpatients at the Albert Dock Hospital, and physician in tropical medicine to the Dreadnought Hospital, Greenwich. During the late war he returned to West Africa, where, with the rank of lieut.-colonel, R.A.M.C., he served as assistant director of pathology to our military Forces. For this work he was mentioned in despatches. In 1940 he was elected F.R.C.P.

After the war Murgatroyd returned to London, and G. M. F., to whom we are indebted for much of the material for this memoir, describes his ever-increasing responsibilities: "He was a consulting physician to the Colonial Office and a member of the typhus diagnostic panel of the Ministry of Health. He was a fellow and member of the council of the Royal Society of Tropical Medicine and Hygiene. He was also the author of the tropical section of the 12th edition of Savill's *System of Clinical Medicine* and Daley & Miller's *Progress in Clinical Medicine*, while he himself published many papers on chemotherapy, malaria, blackwater fever, Weil's disease, and trypanosomiasis." He was also a valued editorial adviser to this journal.

In 1950 he succeeded Sir Neil Hamilton Fairley as professor of clinical tropical medicine in the University of London and as director of the department of clinical tropical medicine at the London School of Hygiene and Tropical Medicine. Since his appointment to his chair the organisation of his department had left him little time for research, but with lessening administrative cares his mind was once more turning in that direction. Of Murgatroyd as an investigator and teacher, C. J. H. writes:

"His approach to all problems was scientific and free from the influence of custom, habit, or mere authority, and his clear-sightedness was carried into his clinical work. As a teacher he was more concerned that his students should think clearly and realistically about their patients than that they should seek the coin of diagnosis to put in the treatment machine. His philosophy was to seek truth in its simplicity and his life was governed by this outlook. He had a keen perception of the virtues of others and he was always a loyal friend. He was a source of strength and encouragement to those who approached him; but his humility often caused him to refrain from offering sound advice until it was asked."

Professor Murgatroyd did much for the re-establishment of the Hospital for Tropical Diseases in London after the war, for it caused him great distress that much tropical material was lost to teaching and research by going to general hospitals in London and the Home Counties. The recent move of the hospital to its present premises gave him great pleasure. One of his colleagues at the hospital and in the teaching school, A. W. W., writes:

"Those who worked with Murgatroyd soon recognised his great breadth of vision, his grasp of a wide range of subjects, and his logical approach to all problems. Whether he was appraising a scientific paper, a book, a clinical problem, or an acquaintance, his impartiality and fairness led him to opinions which commanded respect. His writings and lectures had that clarity which comes of an orderly mind and a deep understanding of his subject. Modest and unassuming, he despised vanity, pomp, pseudo-science in medicine, and, in clinical problems, an approach coloured by emotion. In him there were combined with fine qualities of mind, a striking personality, generosity, humour, kindness, a ready wit, and great fondness for children. He enjoyed tennis, and this year he took up fishing. It was a joy to see his face light up as he recounted tales of his catches.

"Murgatroyd deplored the romantic aura which so often surrounds the memory of those who are dead, their pronouncements, and views. But his own memory will be cherished as one who built upon the rock of hard fact and whose building materials were cold logic and critical observation."

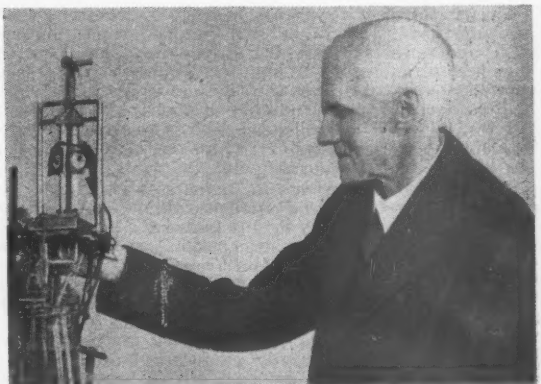
Mrs. Murgatroyd survives her husband.

HENRY STANLEY RAPER

C.B.E., M.B., D.Sc., LL.D. Leeds, F.R.C.P., F.R.S.

Professor Raper, whose death we announced last week, was a physiologist and physiological chemist of international repute. But he refused to sit withdrawn at the ivory bench of the scientist, and his work for medical education was warmed by his interest in clinical medicine and in his students.

He was born at Bradford in 1882, the fifth son of James Raper, and was educated at Bradford Technical College and the University of Leeds where he graduated B.SC. with first-class honours in 1903. With a research scholarship he spent the next three years at the Lister Institute in London, and at Strasbourg University, before he went back to Leeds to complete his medical course. In 1910 he graduated in medicine and as doctor of Science, and in the following year he was appointed to



From the Manchester University Medical School Gazette

a lectureship in pathological chemistry at the University of Toronto. In 1913 he returned to Leeds University to become lecturer in physiological chemistry and later professor of physiology and biochemistry. During the 1914-18 war he was given leave of absence to serve with the R.A.M.C., and by the end of the war, with the rank of lieut.-colonel, he was in charge of the country's research in chemical warfare, at the Royal Engineers Anti-gas Establishment. For this work he was appointed C.B.E. in 1919.

On demobilisation he resumed his chair at Leeds, but in 1923 he succeeded Prof. A. V. Hill in the Manchester chair of physiology, and there he remained; though, as one of his colleagues once wrote, "how we have managed to keep him in spite of all temptations from other schools is a miracle." For his work on fats and carbohydrates he was elected a fellow of the Royal Society in 1929, and he later served on its council. From 1933 to 1939, he was a member of the Medical Research Council, and he represented his own university on the General Medical Council. In 1938, under a special by-law, he was elected F.R.C.P., and in 1943 Leeds conferred on him the honorary degree of LL.D. With the coming of the National Health Service he added further to his responsibilities by becoming a member of the Manchester Regional Hospital Board, a member of the board of governors of the United Manchester Hospitals, and chairman of the Manchester Dental Hospital. He was also chairman of the research committee of the Christie Hospital.

But it was as dean that Raper laid up perhaps his greatest store of affection and gratitude. From the time he first went to Manchester he held this appointment off and on, usually playing Box and Cox with the present vice-chancellor, Sir John Stopford. Of Raper's work as dean Sir John writes:

"No-one within living memory has done more for our medical school, and during the last five years he has carried through with conspicuous success an immense development especially in clinical studies. While he has been dean of the medical school a considerable number of new chairs and departments have been instituted and the smooth and happy way in which the whole reorganisation has been accomplished is a measure of his wisdom, his tact, and the affection felt for him by all his colleagues. His research work in the field of physiological chemistry long ago won international recognition, and up to the time of his death he still found time to pursue investigations although so heavily burdened with administration. His views on medical education were always sound and wise, and he was greatly beloved and trusted by all. He gained the respect, confidence, and affection of staff and students, both of whom constantly sought his advice. He was ever ready to help and never spared himself. Many generations of students at Leeds and Manchester and many others who came under his inspiration when teaching or working in his department are in his debt. To know and to work with Raper was a privilege and our lives have been deeply enriched by his influence; it would be impossible to meet a kinder or more selfless man. He truly lived to serve and enjoyed the opportunity to help his fellow men."

During the past few years he was Manchester's first full-time dean, though he still retained some contact with undergraduate teaching by holding the chair of chemical physiology. When the students heard last summer that the dean was shortly to retire they produced in his honour a special number of their medical school gazette, in which his colleagues and pupils paid tribute to his many-sided personality. Now one of them, A. M., has sent us the following memoir:

"He attracted everyone in so many ways—some by his wide experience and immense knowledge of his subject, but many more by his unusual gentleness and sympathy. He was an exceptionally good listener—patient, quiet, sincerely interested. He was also wonderfully modest. I remember congratulating him on his election to the Royal Society in 1929. He smiled and said it was a nice tribute to his department.

"His contributions to the university of Manchester have been immense, and by no means limited to the faculty of medicine. By his example, his teaching, and his writing he has inspired a generation of our staff and students. On visiting another university 'How's Raper?' was one of the first questions one was asked. As dean, though probably never as personally happy as an administrator as he was as an experimentalist, he has directed our post-war evolution with unsparing diligence and with a far-sightedness beyond praise. Everyone trusted him completely and relied on his decisions. He served the university on court and council and on innumerable committees. He was largely responsible for the inauguration of the Department of Clinical Investigation and Research at the Royal Infirmary and of the Medical Sciences Colloquium. He gave of his best to our medical hostel, Lister House, and to St. Anselm Hall and its house-committee. For a number of years he was hon. treasurer to the Women's Athletic Union, and took great interest in all its activities.

"A charming host, he was never happier than in the lovely garden he had designed and made and tended. He had always been a keen gardener, and a successful one, blessed with patience to breed daffodils—an experiment which usually means working, watching, and waiting for four or five years. In holiday time he spent happy hours over water-colour sketching—a colour-vision defect gave his tones an attractive characteristic, and his drawing, as one would expect, was impeccable.

Professor Raper married in 1911 Miss Edith Allerton. She survives him with two sons.

GEORGE LESTOCK THORNTON

C.B.E., M.C., M.A. Camb., M.R.C.P.

Dr. George Thornton died on Dec. 4 at Hartfield, Sussex, at the age of 79. He was educated at Rossall School, Trinity College, Cambridge, and St. George's Hospital, where he qualified in 1897.

After a period of general practice at Holt, Norfolk, and Ilfracombe, Devon, he returned to St. George's as casualty officer and assistant medical registrar. In 1903 he settled in practice in Exmouth, Devon, and in the same year he obtained the M.R.C.P. For many years he was secretary of the Devon and Exeter Medico-Chirurgical Society, and medical officer to Exmouth Cottage Hospital.

[*Puddicombe, Exmouth*

In 1915 he volunteered for service in the R.A.M.C., and he served in Malta, and later with the 2/6 London Field Ambulance in France, Salonika, and Palestine. While acting as regimental medical officer to the 303rd Brigade he was awarded the M.C. and bar. He returned to general practice for a short time in 1919, but later he accepted the offer of full-time employment in the Ministry of Pensions medical services, and he became deputy commissioner of medical services at Exeter, a post which he held till he retired in 1937.

Between the two wars he devoted much time to the Territorial Army, and a fellow officer writes:

"Colonel Thornton served the Wessex Division devotedly during a quarter of a century as field-ambulance commander, assistant director of medical services, and honorary colonel of its Royal Army Medical Corps, building up each of his successive responsibilities from very small beginnings to heights of which anyone could be proud, by his courage, his example, and his belief in the goodness of his fellow-men. He believed that if a thing was worth doing, it was worth doing to the utmost of one's ability, and he certainly never spared himself. Whether it was a medical unit on parade or in camp, a combatant unit in camp outside the divisional area, a unit social function, or a parade service, if he felt he ought to be there, he got there somehow. He filled all the vacancies of the divisional medical services, in the regiments as well as in the medical units, and he took a keen interest in every officer, and as far as possible in the other ranks. In all things he set the highest standard, and he looked for the best in all who served him. It is fair to say that he nearly always got it, and, on the rare occasions when he did not, he would still hope on. There was no

rebuke; the next confidential report would still find virtues to extol."

From 1930 to 1934 Thornton held the post of honorary physician to the King. He was always keenly interested in the welfare of ex-Service men and women, and he was a member of the British Legion, in which, after his retirement from the Ministry of Pensions, he was able to take office as president of the Exmouth branch.

In 1943 his wife was killed in a daylight air-raid on Exmouth, and his home was totally destroyed, but it was typical of his devotion to duty that he returned to work at his Exeter office the following day. He is survived by a daughter and three sons, two of whom are doctors.

Births, Marriages, and Deaths

BIRTHS

DIXON.—On Dec. 13, at Southsea, the wife of Dr. G. E. Dixon—a daughter.

FLEMING.—On Dec. 16, at Taunton, the wife of Dr. Donald Fleming—a son.

GRZYBOWSKI.—On Dec. 7, at Chelmsford, Dr. Betty Grzybowski (née Poland) the wife of Dr. Stefan Grzybowski—a son.

HUGHES.—On Dec. 10, at Bristol, the wife of Dr. E. B. Hughes—a daughter.

SLOAN.—On Dec. 14, at Preston, Weymouth, the wife of Dr. D. R. Sloan—a son.

MARRIAGES

JAMES—SHERLOCK.—On Dec. 15, in London, D. Geraint James, M.R.C.P., to Sheila Sherlock, F.R.C.P.

DEATHS

HUXTABLE.—On Dec. 14, in London, Arthur Edward Huxtable, M.C., M.R.C.S., of Bexhill.

MCCOMAS.—On Dec. 13, in Dorking, Cyril Henry McComas, M.D. Dubl.

MURGATROYD.—On Dec. 16, in London, Frederick Murgatroyd, M.D. Lpool, F.R.C.P.

RICHMOND.—On Dec. 16, Henry Richmond, M.B. Birm., of Standish, near Wigan, aged 64.

Appointments

CHALMERS, WILLIAM, M.B. Leeds: appointed factory doctor, Bradford, Cleckheaton district, Yorkshire.

CRAIG, A., M.B.: psychiatrist, Bellsdyke Mental Hospital, Larbert, and associated clinics.

MOORE, ROBERT, M.B. Lond., M.R.C.P.: senior medical registrar, St. Andrew's Hospital, London.

SCOULAR, G. H., M.B. Glasg., D.P.H.: administrative medical superintendent, hospitals in the Northern and Southern Ayrshire areas.

Newcastle Regional Hospital Board:

LAWS, G. J., B.A., M.B. Camb., D.P.H.: consultant pathologist, Hexham H.M.C. group.

LOUGHRAN, A. M., M.B. Edin., F.R.C.S.E.: consultant surgeon, West Cumberland H.M.C. group.

SHEPPARD, D. M., D.S.C., M.B. Edin., F.R.C.S.E., M.R.C.O.G.: asst. obstetrician and gynæcologist, Middlesbrough Maternity Hospital, North Ormesby Hospital, Sedgefield Hospital, and Stockton and Thornaby Hospital.

SMITH, H. HUNTER, M.B., D.A.: anæsthetist, East Cumberland.

WALSH, W. M., M.B. N.U.I., D.P.H.: asst. physician (infectious diseases) to the board.

WILLEY, C. B. I., M.A., B.M. Oxfd, M.R.C.P.: consultant physician, West Cumberland H.M.C. group.

Colonial Service:

BATTEN, K. L., M.B. Lond.: M.O., Uganda.

BLAKE-KNOX, P. E. A., M.B. Dubl.: M.O., Tanganyika.

BOYD, P. I., M.D. Lond., M.P.H.: M.O. (grade B, health), Trinidad.

BRYCE, J. C., M.B.: M.O., Sierra Leone.

CYWINSKI, CEZARY, M.B. Polish School of Medicine: M.O., Federation of Malaya.

EBERLIE, W. J. D., M.B. Camb., M.R.C.P.: special grade M.O., Nyasaland.

FORSTER, E. F. B., B.A., M.B. Dubl.: specialist (psychiatrist). Gold Coast.

GILBERT, W. T. M., L.R.C.P.I.: asst. director of medical services, Gold Coast.

HASSAN, B. V., M.B. Belf: M.O., Federation of Malaya.

HOWARD, A. C., M.D. Lond.: senior M.O. in charge, Zanzibar.

JELLIFFE, R. S., M.B. Lond.: M.O., Nigeria.

KARRACH, H. A., M.B. Dubl.: M.O., Uganda.

KINMAN, H. L., L.R.C.P.E.: M.O. (temporary), Nigeria.

POGONOWSKI, J. S. B., M.B. Polish School of Medicine: asst. M.O. (temporary), General Hospital, Bahamas.

STUART, EUGENE, M.B. N.U.I.: M.O., Nigeria.

SZURKAWSKI, A. S., M.B. Lond.: M.O. (temporary), Nigeria.

WOLFE, W. G., M.D.: M.O., Tanganyika.

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Notes and News

ANY QUESTIONS?

READERS of the *British Medical Journal* will know well the brains trust which appears each week under this title. Questions from all over the world are answered by a team of experts. The selection from these answers which has now been published [1] gives much practical information not to be found in textbooks. There is nothing which the team will not tackle; the sterilisation of an electric shaver, the removal of tattoo marks, and the preserving of fruit all come within their range. The book is clearly set out and bound in a convenient size for the pocket. We are sure that many doctors will be glad to have this fund of knowledge with them as they go about their work.

THE AFRICAN CHILD

AT a meeting of the Royal Society of Tropical Medicine on Dec. 13, Dr. D. B. Jelliffe, senior lecturer in medicine at University College, Ibadan, Nigeria, spoke on the African Child. Ibadan is a large city with a low standard of hygiene, and at the hospital there is ample material for study.

The African infant has a poor chance of survival. He is usually born under-weight and physiologically immature, in primitive surroundings. His umbilicus will probably become infested, perhaps with tetanus spores, and he is more than likely to have an umbilical hernia. He may be born to share his mother's (or grandmother's) milk with a brother 2 or 3 years old; and the milk may be thin, though the protein content is often unexpectedly high. Congenital syphilis and relapsing fever are common; congenital malaria no doubt occurs, and toxoplasmosis is recorded. Congenital deformities are about as common as in Europe, but in Africa they carry a special risk to life—for instance, the risk of bronchopneumonia in severe hare-lip. If the newborn child survives the first few days he must face the three great groups of infections—namely, infections of the respiratory tract, septic infections, and infections of the gastro-intestinal tract. These are the killing diseases, and they operate on a basis of malaria before premunition has been achieved. These infections are the more deadly because, owing to malnutrition, the body cannot stand the extra strain imposed by them. The infant is dehydrated and desperately ill, and often is brought to hospital too late. Apart from breast-milk, which cannot satisfy the needs of older children, food consists of a gruel; and this may be given by hand so clumsily that it enters the trachea and lung. Dr. Jelliffe also described and illustrated infective gangrene of the mouth, which differs from cancrum oris in that it infects the bones. This terrible and destructive disease, which may strip the tissues from half the side of the face, can be cured by penicillin if treatment is started early; but in such cases, although a remarkable amount of lost tissue is replaced, there may be gross permanent disfigurement. The ætiology of this condition is not clear; but infection evidently plays a large part, and no doubt the malnourishment of the tissues is a major factor. The infant-mortality rate is estimated at about 300–500 per 1000 live births. Dr. Jelliffe painted a sad picture; but this is relieved by signs of a desire for more education on the part of the African mothers.

D.D.T.-RESISTANT LICE IN KOREA

THE U.S. army medical service, in coöperation with the U.S. department of agriculture, has developed for use in Korea new insecticides capable of controlling Korean body-lice which are resistant to D.D.T. New preparations of lindane and pyrethrum powder are being used to protect troops against louse-borne epidemic typhus which might be introduced by infected North Korean and Chinese prisoners-of-war. Both substances are highly effective against the Korean louse and are safe for human use. They will also be used to disinfect prisoners-of-war and civilians when further supplies are available.

As far as is known, D.D.T. is still effective against lice and other insects in most other areas of the world. Both lindane and pyrethrum are actually less potent than D.D.T. against lice in the United States. The U.S. army medical service proposes to carry out a survey to determine the extent of immunity to D.D.T. in insects and other disease-carriers in many countries.

1. Any Questions? London: B.M.A., Tavistock Square, London, W.C.1. 1951. Pp. 240. 7s. 6d.

United Nations forces have been relatively untroubled by the stubborn Korean louse—principally because of the work of preventive medicine companies, and the strict sanitary discipline in the field. Routine immunisation against epidemic typhus has given additional protection.

A FILM ON VACCINATION

THE Ministry of Health has had a film made to encourage the vaccination of children in infancy. *Surprise Attack* tells something of a little girl's smallpox and the doctors' steps to limit an epidemic. It is well made and deserves showing in public cinemas and to parents' and teachers' groups, and also in medical and nursing schools to illustrate the set lecture on the subject. The film (running-time 10 minutes) is available from the Central Film Library, 4, Great Russell Street, W.C.1.

University of Oxford

Dr. Wilson A. Swanker, of New York, will lecture at the Radcliffe Infirmary, Oxford, on Monday, Jan. 7, at 8 P.M., on the Use of Gelatinised Bone in the Repair of Skeletal Defects.

University of Cambridge

Raymond Horton-Smith prize.—This prize for 1950–51 has been awarded to Dr. H. R. Jolly. *Proxime accessit:* Dr. J. A. R. Miles.

University of London

Dr. C. F. Harris, dean of St. Bartholomew's Hospital Medical College, has been appointed representative of the faculty of medicine on the senate for the remainder of the period 1950–54, in place of the late Mr. J. B. Hunter.

University of Durham

On Dec. 14, the following degrees were conferred:

M.B., B.S.—J. R. B. Ball, E. I. Blenkinsop, Robert Bruce, G. Y. Caldwell, A. I. A. Charlton, Z. H. Cywicki, James Dixon, John Fitzgerald, Joyce H. Hindmarsh, Walter Holmes, W. E. J. Kirby, P. H. D. Lewars, J. B. Lilly, Jean M. McIvor, J. F. Mather, F. C. Pickering, I. R. Pyle, J. B. Richardson, T. M. C. Saint, W. A. Shiells, Margaret Sibson, Henry Tubmen.

University of Liverpool

At recent examinations the following were successful:

M.D.—K. McCarthy, I. P. Madhok, H. Roberts.

M.Ch.Orth.—W. J. Betts, P. Chandra, K. R. Daymond, G. F. Fischer, F. J. Gruar, D. R. Gunn, A. K. Gupta, M. Natarajan, J. A. O'Garra, J. S. Roarty, I. W. Winchester, W. H. de W. de Wytt.

University of Manchester

At recent examinations the following were successful:

Final M.B., Ch.B.—J. R. Jaffe, D. W. Preston (old regulations); James Ashworth, F. N. Bamford, Freda A. Broadhurst, Barbara Clough, E. M. Coates, John Cragg, Lawrence Duggan, J. H. A. Dwek, Margaret J. Foulds, Patrick Fulton, P. W. Gilman, T. T. Glancy, E. N. Gold, Dorothy M. Gratton, P. G. Haddock, C. S. Hajikakou, E. G. R. Jones, R. J. Lande, J. B. Law, B. E. Marks, G. H. Mazey, Elsa M. Mellor, G. W. H. Oldfield, Leon Poller, H. J. Reynolds, G. B. Ross, Derek Rothwell G. J. Ryder, Frederick Smith, G. F. Smith, O. T. Taylor, P. R. Ward, W. A. Whittaker, Allan Withnell (new regulations).

D.P.M.—H. S. Coulsting, M. M. Lidgate, Edith M. Thorp.

University of Edinburgh

On Dec. 14 the following degrees and diplomas were conferred:

M.D.—R. M. Fulton, A. R. Somner (highly commended); *P. F. de Cairos, *C. E. L. Haffner, *Thomas Harrison, Harry Oswald-Smith, A. S. L. Rae.

Ph.D. (in the faculty of medicine).—Deb Prasanna Basu, A. S. Outschoorn.

M.B., Ch.B.—Audrey N. H. Andrew, W. R. C. Andrew, E. S. Blackadder, F. K. P. Brydon, R. C. Buchanan, Isobel C. Campbell, G. M. Dewar, J. M. P. Dippenaar, W. F. M. Dorward, P. T. Fraser, P. W. E. Hayward, R. S. Jarema, J. H. Jennings, D. F. Kerr, Margaret L. Liddell, D. W. Lyon, Mary I. McArthur, Ranald Macdonald, M. A. McFadyen, D. W. Maxa, A. E. Meek, C. C. Moir, G. D. E. Morris, J. E. Munro, A. E. M. Reekie, W. D. Riddell, A. A. Robertson, A. H. I. Scott, W. A. Simpson, R. M. Stewart, J. H. Sutherland, G. P. Syme-Thomson, J. M. Tainsh, Jean C. Taylor, C. G. M. Third, F. A. Viapree, F. E. B. Wills, *Margaret J. Field.

D.M.R.-D.—Alan Lien-yiu Chen, J. M. McKay, Mihir Kumar Mitter.

D.M.R.-T.—W. D. Rider.

* In absentia.

Dr. John Crofton has been appointed to the chair of tuberculosis and diseases of the respiratory system.

Dr. Crofton, who qualified in 1936, graduated M.B. Camb. in 1937. After holding house-appointments at St. Thomas's Hospital and a registrarship at the Brompton Hospital, he joined the scientific staff of the Medical Research Council, later becoming senior medical assistant at the Institute for Diseases of the Chest. During the war he served in the R.A.M.C. with the rank of lieut.-colonel. At present he is physician to Hammersmith Hospital and lecturer in diseases of the chest at the Postgraduate Medical School of London. He is also chief clinical assistant at the Brompton Hospital. His published work deals chiefly with the use of streptomycin in the treatment of pulmonary tuberculosis. He took his M.D. in 1947 and he was elected F.R.C.P. this year.

Under the will of Dr. Colin Gordon, of St. Saviour, Jersey, the university is to receive some £60,000 which will be used to found research scholarships in medicine and science. Dr. Gordon graduated at Edinburgh in 1889.

University of Glasgow

On Dec. 5, the degree of doctor of medicine was conferred in absentia by diploma upon John Vaughn.

Royal College of Surgeons of England

At a meeting of the council on Dec. 13, with Sir Cecil Wakeley, the president, in the chair, Hunterian professorships were awarded to Mr. R. F. Phillips, of New York, for a lecture on Neuroblastoma and to Prof. Naguib Makar Bey, of Cairo, for a lecture on Pathogenesis of Cancer in the Bilharzial Bladder. For 1952 Mr. P. H. Mitchiner was appointed Bradshaw lecturer; Mr. V. Zachary Cope, Thomas Vicary lecturer; and Mr. St.J. D. Buxton, Robert Jones lecturer. Prof. George Perkins was appointed Robert Jones lecturer for 1953.

The following diplomas were granted:

F.R.C.S.—I. M. Shulman, G. D. Elphick, S. G. Griffin, D. E. Macrae, Denis Bartlett, H. G. Stack, A. C. Hicks, K. A. McNeill, J. R. Wilson, Paul Dawson-Edwards, H. B. Jacobs, J. P. Partridge, G. H. Bancroft-Livingston, T. J. S. Patterson, G. L. Bunton, Percy Weinstein, R. A. Denham, J. M. Kodicek, A. H. C. Ratliff, Grace M. Lukose, A. H. Levy, D. H. K. Soltau, Gnaneshwar Rao Baji, L. D. Abrams, F. J. P. O'Gorman, Sachindranath Roy, C. F. Chapple, E. I. H. Mason, W. S. Smith, Kandiah Vythilingam, Prins Dharmaratnam Rajaratnam, Eliasz Zwiefach, L. J. McF. Black, S. R. Taitz, D. J. du Plessis, P. L. McNeil, B. I. H. McPherson, Abdur Rahim, N. R. Scott-Young, R. A. Hill, R. M. Laird, C. B. Noble, Norman Slade, Stevens Dimant, Ibrahim El-Wakil, K. V. J. Kearney, A. H. MacLean, Terence McSweeney, W. E. Swaney, Ronald Hunter, Raouf Guindy Abo-Seif, D. E. Bolt, S. A. Cabraal, G. R. Carr, P. H. Dickinson, G. E. Flatman, E. H. Hadfield, W. F. Herlihy, J. S. Hopkirk, Narayan Laxman Kalle, Narayan Dattatray Kamat, J. L. Swann, J. G. Callanan, Arvind Purshottam Desai, D. M. Forrest, Mohammed Monazeral Hasan, M. R. Kliman, J. A. McCredie, P. P. McGarry, Ahmad Abdel Khalik Motawi, Robert Owen, J. C. Parr, D. W. Purser, J. B. Pyper, R. A. Bremner, Tara Chandra, Homi Nasservanji Dastur, Noor Ellahee, Granville Freeman, Iris Kane, J. F. Mullan, R. C. Read, D. B. Rogers, J. E. M. Smith, J. A. Snell, Harold Ellis, A. D. Hodge, I. M. Maresky, S. H. Watson, A. M. Wiley.

M.R.C.S.—L. D. Abrams.

Conjoint Board in Ireland

At recent examinations the following were successful:

D.C.H.—V. Barry, D. C. J. Carter, G. Cremer, C. P. Nanavati, W. P. O'Keeffe, K. J. Quinn, Carmel P. Ryan.

D.A.—C. A. G. Armstrong, J. C. Clarke, Patricia Delany, E. A. Frayworth, L. McArdle, J. A. McNeilly, Patricia O'Neill, J. H. Tyrrell, N. Zwick.

Register of Chiropodists

The Board of Registration of Medical Auxiliaries have now published the 1951 register of chiropodists. Copies may be had from the secretary of the board, B.M.A. House, Tavistock Square, London, W.C.1.

Osler Club

A symposium on the history of pneumonia will be held on Friday, Jan. 11, at 7.45 P.M., at 11, Chandos Street, London, W.1. Lord Horder will speak on Osler and Pneumonia, Sir Lionel Whitby on the Advent of the Sulphonamides, and Sir Adolphe Abrahams on the Changing Character of the Disease.

Blood Donors

During the September quarter this year 24,670 new donors joined the National Blood Transfusion Service in England and Wales, bringing the total to 453,483—the highest since the war. Even so, another 172,000 donors are needed.

Salary Increase for Hospital Administrators

The Industrial Court has increased the salary scales of senior administrative officers employed by hospital authorities in the National Health Service. About 2200 employees will be affected. Under the new scales the lowest salary the secretary of a hospital management committee can receive will be £745 (£640 on present scale) and the highest £1900 (£1700). Other rises are: secretary of a board of governors of an undergraduate teaching hospital £1850 (£1750) to £2250 (£2000); secretary of a Metropolitan regional hospital board £1600 (£1400) to £2100 (£1700). The increases are less than the staff side claimed, but more than the management side offered.

day—and incidentally high respiratory tuberculosis mortality-rates also.

The time is ripe, I believe, to free the use of B.C.G. vaccine from restrictions and to allow those responsible for the prevention of tuberculosis to use it as they consider fit, in the best interests of the area for which they are responsible. Considering the different immunological backgrounds of the populations of the various areas of Britain, I doubt very much if the results of an attempted controlled experiment in the use of this vaccine would be applicable to any area other than that in which the experiment was carried out.

County Public Health Department, Dingwall, Ross-shire. J. LANDESS HORNE.

VARIATIONS IN RESPONSE TO RELAXANT DRUGS

SIR,—Dr. Dundee and Dr. Gray in their interesting article (Dec. 1) state that drugs acting by depolarisation block produce a normal effect in myasthenic patients. The work of Paton and Zaimis [1] in animals has shown that those muscles which are hypersensitive to *d*-tubocurarine chloride are resistant to decamethonium iodide. Consequently, it might be anticipated that the muscles of patients with myasthenia gravis, which are known to be sensitive to *d*-tubocurarine chloride, would in fact be tolerant to decamethonium iodide.

Dr. Dundee and Dr. Gray gave 0·95 mg. decamethonium iodide in divided doses to one patient with myasthenia gravis and noted the effect on the volume of respiration. As there were no signs of sensitivity they concluded that the response of their "myasthenic patient to decamethonium iodide was within the limits of normality." Our findings,[2] based on an investigation of eleven cases of myasthenia gravis, indicate that the peripheral musculature of these patients is resistant to the depolarising action of decamethonium iodide.

H. C. CHURCHILL-DAVIDSON
St. Thomas's Hospital, London, S.E.1. A. T. RICHARDSON.

LYSOGENICITY IN BACTERIOPHAGE STRAINS

SIR,—May I point out a mistake in your annotation of Nov. 24? You state that Bertani's [3] work was accomplished by ultraviolet irradiation. Almost the reverse was true, since he was unable to induce lysis by this method.

Animal Health Trust Livestock Research Station, Houghton, Huntingdonshire. H. WILLIAMS SMITH.

THE TIME OF DEATH

SIR,—At an inquest held on Dec. 11 on a man hanged at Lincoln Gaol, the medical officer of the prison, when asked by the coroner if death was instantaneous, said:

> "I wish to add one thing in explanation of something your predecessor remarked to me. He told me I should not say that a man's death was instantaneous if his heart continued to beat. The man is to all intents and purposes dead the minute his neck is dislocated. He cannot breathe any more, and the loss of consciousness is instantaneous. But the heart does continue to beat for anything up to 20 minutes. It is a purely automatic function and does not mean that that man is alive. I think I should make that clear in view of the observation of your predecessor." [4]

I believe my father, the late Dr. Llewellyn A. Morgan, who was medical officer at the old Newgate Prison between the years 1882 and 1887, was the first to demonstrate the heart-beats following judicial hangings there.

At that time Professor Dudgeon of St. Thomas's Hospital invented an instrument to record the radial pulse, known as Dudgeon's sphygmograph. This little instrument, actuated by a clockwork mechanism, recorded the pulse on a strip of carbon paper, and my father used to dash into the pit immediately after the drop, attach the sphygmograph to the man's wrist, and run off tracings. These tracings showed clearly that the heart stopped for a few seconds immediately after the drop, and then recovered, resuming an apparently normal beat for a period as long as 8 minutes, after which the beats became more and more feeble, finally fading out. The heart would no doubt beat a little longer than would be discernible at the pulse and maybe for as long as 20 minutes. My father's tracings were reproduced in Buchanan's *Medical Jurisprudence and Toxicology*, published, I think, in 1912.

An interesting medicolegal point arises from the coroner's question and the prison medical officer's reply. According to Glaister,[5] "death may be defined as complete and persistent cessation of respiration *and circulation*" (italics mine). Consequently, in the case in question death did not take place until the heart ceased to beat, and the reply, on strictly legal grounds, to the coroner's question would appear to be that while there was instantaneous oblivion, death (i.e., somatic death) took place some minutes after the process of execution.

I am not disputing the appropriateness of the answer of the prison medical officer before a coroner's jury, but the coroner's question is pertinent. There are cases where respiration is arrested—for instance by paralysis of the respiratory centre—in which circulation is unaffected and artificial respiration will reproduce the appearance of life though the patient is in fact "somatically" dead; or is he?

The point at issue is perhaps academic but may have a bearing on the validity of a death certificate signed before a person is legally dead.

Guildhall, London, E.C.2. M. T. MORGAN.

QUICK TESTS

SIR,—In various articles on hæmophilia that Dr. Merskey has recently published, including one written jointly with Dr. Macfarlane and published in THE LANCET,[6] he describes a procedure which he has designated Quick's test for hæmophilia. This method, which I published ten years ago,[7] depends on the effect of differential centrifugation on the clotting-time of recalcified plasma. Until recently the test served as a useful means for diagnosing hæmophilia although it has limitations similar to those of the clotting-time.

If my name is to be attached to a method for the diagnosis of hæmophilia I should prefer that it be to the prothrombin-consumption time,[8] or to a modification of this test [9] in which the prothrombin is determined in the serum obtained from blood to which heated rabbit-brain extract has been added. To avoid the absurdity of calling this Quick's test for hæmophilia no. 3, it has been tentatively designated "the thromboplastinogen-activity time." Irrespective of whether the name meets the approval of the coagulationists, the test appears to be the most promising means for detecting exceedingly mild cases of hæmophilia.

I have devoted much thought and effort to selecting a specific name for every test which I have devised. I did this to obviate its becoming a Quick test. Perhaps I have been over-conscientious. Within a short time, I am sure, the capital "Q" will change to a small "q." Since the prothrombin-time for normal blood is 12 seconds and the prothrombin-consumption time for hæmophilic blood is 8–12 seconds, no-one—not even my severest critics—should find too much objection to having the name Quick attached to these tests, especially since there is the hope that the "Q" will eventually lose its capital status.

Marquette University School of Medicine, Milwaukee, Wisconsin, U.S.A. ARMAND J. QUICK.

1. Paton, W. D. M., Zaimis, E. J. *J. Physiol.* 1951, **112**, 311.
2. *J. Neurol. Neurosurg. Psychiat.* (in the press).
3. Bertani, G. *J. Bact.* 1951, **62**, 293.
4. *Times*, Dec. 12, 1951, p. 3.
5. Glaister, J. Medical Jurisprudence and Toxicology. Edinburgh. 1945.
6. Merskey, C., Macfarlane, R. G. *Lancet*, 1950, i, 487.
7. *Amer. J. med. Sci.* 1941, **201**, 469.
8. *Ibid.* 1947, **214**, 212.
9. *J. Lab. clin. Med.* (in the press).

Obituary

FREDERICK MURGATROYD

M.D. Lpool, F.R.C.P., D.T.M. & H.

Professor Murgatroyd came from Liverpool to London in 1937 to join the staff of the Hospital for Tropical Diseases, and last year he was appointed to the Wellcome chair of clinical tropical medicine at the London School of Hygiene. Through his death, on Dec. 16, at the age of 49, and at the top of his powers, tropical medicine has lost one of its most incisive minds.

He graduated M.B. with honours at the University of Liverpool in 1926 and soon afterwards he was persuaded to take up tropical medicine by Warrington Yorke. Murgatroyd used to recall how Yorke, who was a patient in the ward in which Murgatroyd was house-physician, asked what he proposed to do for his career. Murgatroyd replied that he was thinking of taking up neurology. Yorke greeted this reply with some disparaging remarks and offered the challenge that tropical medicine afforded the best scope for an intelligent man. He added an invitation for Murgatroyd to join his department. This was the beginning of an association of the highest value to Murgatroyd.

In 1927 he was appointed lecturer in protozoology at the Liverpool School of Tropical medicine, and the same year he took his D.T.M. & H. Later he became clinical pathologist and, in 1934, lecturer in tropical medicine to the school and assistant physician for tropical diseases at the Liverpool Royal Infirmary. During these years he had been carrying out, with Warrington Yorke, a series of investigations on the mode of action of drugs in sleeping-sickness, and in 1936, as the first senior research fellow in tropical medicine of the Medical Research Council, he was seconded to the Gambia to continue this work in the field.

In 1937 he was appointed lecturer in clinical tropical medicine at the London School of Hygiene and Tropical Medicine. He also became assistant physician at the Hospital for Tropical Diseases, physician with charge of outpatients at the Albert Dock Hospital, and physician in tropical medicine to the Dreadnought Hospital, Greenwich. During the late war he returned to West Africa, where, with the rank of lieut.-colonel, R.A.M.C., he served as assistant director of pathology to our military Forces. For this work he was mentioned in despatches. In 1940 he was elected F.R.C.P.

After the war Murgatroyd returned to London, and G. M. F., to whom we are indebted for much of the material for this memoir, describes his ever-increasing responsibilities: "He was a consulting physician to the Colonial Office and a member of the typhus diagnostic panel of the Ministry of Health. He was a fellow and member of the council of the Royal Society of Tropical Medicine and Hygiene. He was also the author of the tropical section of the 12th edition of Savill's *System of Clinical Medicine* and Daley & Miller's *Progress in Clinical Medicine*, while he himself published many papers on chemotherapy, malaria, blackwater fever, Weil's disease, and trypanosomiasis." He was also a valued editorial adviser to this journal.

In 1950 he succeeded Sir Neil Hamilton Fairley as professor of clinical tropical medicine in the University of London and as director of the department of clinical tropical medicine at the London School of Hygiene and Tropical Medicine. Since his appointment to his chair the organisation of his department had left him little time for research, but with lessening administrative cares his mind was once more turning in that direction. Of Murgatroyd as an investigator and teacher, C. J. H. writes:

"His approach to all problems was scientific and free from the influence of custom, habit, or mere authority, and his clear-sightedness was carried into his clinical work. As a teacher he was more concerned that his students should think clearly and realistically about their patients than that they should seek the coin of diagnosis to put in the treatment machine. His philosophy was to seek truth in its simplicity and his life was governed by this outlook. He had a keen perception of the virtues of others and he was always a loyal friend. He was a source of strength and encouragement to those who approached him; but his humility often caused him to refrain from offering sound advice until it was asked."

Professor Murgatroyd did much for the re-establishment of the Hospital for Tropical Diseases in London after the war, for it caused him great distress that much tropical material was lost to teaching and research by going to general hospitals in London and the Home Counties. The recent move of the hospital to its present premises gave him great pleasure. One of his colleagues at the hospital and in the teaching school, A. W. W., writes:

"Those who worked with Murgatroyd soon recognised his great breadth of vision, his grasp of a wide range of subjects, and his logical approach to all problems. Whether he was appraising a scientific paper, a book, a clinical problem, or an acquaintance, his impartiality and fairness led him to opinions which commanded respect. His writings and lectures had that clarity which comes of an orderly mind and a deep understanding of his subject. Modest and unassuming, he despised vanity, pomp, pseudo-science in medicine, and, in clinical problems, an approach coloured by emotion. In him there were combined with fine qualities of mind, a striking personality, generosity, humour, kindness, a ready wit, and great fondness for children. He enjoyed tennis, and this year he took up fishing. It was a joy to see his face light up as he recounted tales of his catches.

"Murgatroyd deplored the romantic aura which so often surrounds the memory of those who are dead, their pronouncements, and views. But his own memory will be cherished as one who built upon the rock of hard fact and whose building materials were cold logic and critical observation."

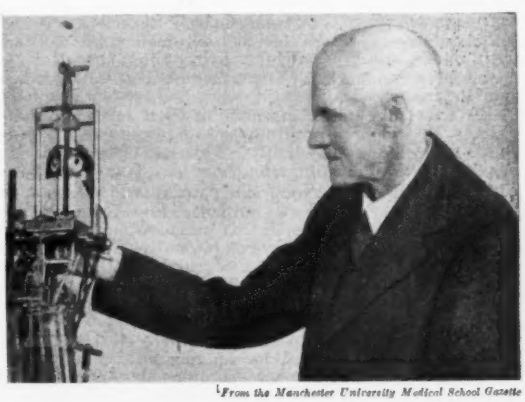
Mrs. Murgatroyd survives her husband.

HENRY STANLEY RAPER

C.B.E., M.B., D.Sc., LL.D. Leeds, F.R.C.P., F.R.S.

Professor Raper, whose death we announced last week, was a physiologist and physiological chemist of international repute. But he refused to sit withdrawn at the ivory bench of the scientist, and his work for medical education was warmed by his interest in clinical medicine and in his students.

He was born at Bradford in 1882, the fifth son of James Raper, and was educated at Bradford Technical College and the University of Leeds where he graduated B.SC. with first-class honours in 1903. With a research scholarship he spent the next three years at the Lister Institute in London, and at Strasbourg University, before he went back to Leeds to complete his medical course. In 1910 he graduated in medicine and as doctor of Science, and in the following year he was appointed to



[From the Manchester University Medical School Gazette

a lectureship in pathological chemistry at the University of Toronto. In 1913 he returned to Leeds University to become lecturer in physiological chemistry and later professor of physiology and biochemistry. During the 1914-18 war he was given leave of absence to serve with the R.A.M.C., and by the end of the war, with the rank of lieut.-colonel, he was in charge of the country's research in chemical warfare, at the Royal Engineers Anti-gas Establishment. For this work he was appointed C.B.E. in 1919.

On demobilisation he resumed his chair at Leeds, but in 1923 he succeeded Prof. A. V. Hill in the Manchester chair of physiology, and there he remained; though, as one of his colleagues once wrote, "how we have managed to keep him in spite of all temptations from other schools is a miracle." For his work on fats and carbohydrates he was elected a fellow of the Royal Society in 1929, and he later served on its council. From 1933 to 1939, he was a member of the Medical Research Council, and he represented his own university on the General Medical Council. In 1938, under a special by-law, he was elected F.R.C.P., and in 1943 Leeds conferred on him the honorary degree of LL.D. With the coming of the National Health Service he added further to his responsibilities by becoming a member of the Manchester Regional Hospital Board, a member of the board of governors of the United Manchester Hospitals, and chairman of the Manchester Dental Hospital. He was also chairman of the research committee of the Christie Hospital.

But it was as dean that Raper laid up perhaps his greatest store of affection and gratitude. From the time he first went to Manchester he held this appointment off and on, usually playing Box and Cox with the present vice-chancellor, Sir John Stopford. Of Raper's work as dean Sir John writes:

"No-one within living memory has done more for our medical school, and during the last five years he has carried through with conspicuous success an immense development especially in clinical studies. While he has been dean of the medical school a considerable number of new chairs and departments have been instituted and the smooth and happy way in which the whole reorganisation has been accomplished is a measure of his wisdom, his tact, and the affection felt for him by all his colleagues. His research work in the field of physiological chemistry long ago won international recognition, and up to the time of his death he still found time to pursue investigations although so heavily burdened with administration. His views on medical education were always sound and wise, and he was greatly beloved and trusted by all. He gained the respect, confidence, and affection of staff and students, both of whom constantly sought his advice. He was ever ready to help and never spared himself. Many generations of students at Leeds and Manchester and many others who came under his inspiration when teaching or working in his department are in his debt. To know and to work with Raper was a privilege and our lives have been deeply enriched by his influence; it would be impossible to meet a kinder or more selfless man. He truly lived to serve and enjoyed the opportunity to help his fellow men."

During the past few years he was Manchester's first full-time dean, though he still retained some contact with undergraduate teaching by holding the chair of chemical physiology. When the students heard last summer that the dean was shortly to retire they produced in his honour a special number of their medical school gazette, in which his colleagues and pupils paid tribute to his many-sided personality. Now one of them, A. M., has sent us the following memoir:

"He attracted everyone in so many ways—some by his wide experience and immense knowledge of his subject, but many more by his unusual gentleness and sympathy. He was an exceptionally good listener—patient, quiet, sincerely interested. He was also wonderfully modest. I remember congratulating him on his election to the Royal Society in 1929. He smiled and said it was a nice tribute to his department.

"His contributions to the university of Manchester have been immense, and by no means limited to the faculty of medicine. By his example, his teaching, and his writing he has inspired a generation of our staff and students. On visiting another university 'How's Raper?' was one of the first questions one was asked. As dean, though probably never as personally happy as an administrator as he was as an experimentalist, he has directed our post-war evolution with unsparing diligence and with a far-sightedness beyond praise. Everyone trusted him completely and relied on his decisions. He served the university on court and council and on innumerable committees. He was largely responsible for the inauguration of the Department of Clinical Investigation and Research at the Royal Infirmary and of the Medical Sciences Colloquium. He gave of his best to our medical hostel, Lister House, and to St. Anselm Hall and its house-committee. For a number of years he was hon. treasurer to the Women's Athletic Union, and took great interest in all its activities.

"A charming host, he was never happier than in the lovely garden he had designed and made and tended. He had always been a keen gardener, and a successful one, blessed with patience to breed daffodils—an experiment which usually means working, watching, and waiting for four or five years. In holiday time he spent happy hours over water-colour sketching—a colour-vision defect gave his tones an attractive characteristic, and his drawing, as one would expect, was impeccable.

Professor Raper married in 1911 Miss Edith Allerton. She survives him with two sons.

GEORGE LESTOCK THORNTON

C.B.E., M.C., M.A. Camb., M.R.C.P.

Dr. George Thornton died on Dec. 4 at Hartfield, Sussex, at the age of 79. He was educated at Rossall School, Trinity College, Cambridge, and St. George's Hospital, where he qualified in 1897.

After a period of general practice at Holt, Norfolk, and Ilfracombe, Devon, he returned to St. George's as casualty officer and assistant medical registrar. In 1903 he settled in practice in Exmouth, Devon, and in the same year he obtained the M.R.C.P. For many years he was secretary of the Devon and Exeter Medico-Chirurgical Society, and medical officer to Exmouth Cottage Hospital.

[Puddicombe, Exmouth

In 1915 he volunteered for service in the R.A.M.C., and he served in Malta, and later with the 2/6 London Field Ambulance in France, Salonika, and Palestine. While acting as regimental medical officer to the 303rd Brigade he was awarded the M.C. and bar. He returned to general practice for a short time in 1919, but later he accepted the offer of full-time employment in the Ministry of Pensions medical services, and he became deputy commissioner of medical services at Exeter, a post which he held till he retired in 1937.

Between the two wars he devoted much time to the Territorial Army, and a fellow officer writes:

"Colonel Thornton served the Wessex Division devotedly during a quarter of a century as field-ambulance commander, assistant director of medical services, and honorary colonel of its Royal Army Medical Corps, building up each of his successive responsibilities from very small beginnings to heights of which anyone could be proud, by his courage, his example, and his belief in the goodness of his fellow-men. He believed that if a thing was worth doing, it was worth doing to the utmost of one's ability, and he certainly never spared himself. Whether it was a medical unit on parade or in camp, a combatant unit in camp outside the divisional area, a unit social function, or a parade service, if he felt he ought to be there, he got there somehow. He filled all the vacancies of the divisional medical services, in the regiments as well as in the medical units, and he took a keen interest in every officer, and as far as possible in the other ranks. In all things he set the highest standard, and he looked for the best in all who served him. It is fair to say that he nearly always got it, and, on the rare occasions when he did not, he would still hope on. There was no

rebuke; the next confidential report would still find virtues to extol."

From 1930 to 1934 Thornton held the post of honorary physician to the King. He was always keenly interested in the welfare of ex-Service men and women, and he was a member of the British Legion, in which, after his retirement from the Ministry of Pensions, he was able to take office as president of the Exmouth branch.

In 1943 his wife was killed in a daylight air-raid on Exmouth, and his home was totally destroyed, but it was typical of his devotion to duty that he returned to work at his Exeter office the following day. He is survived by a daughter and three sons, two of whom are doctors.

Births, Marriages, and Deaths

BIRTHS

DIXON.—On Dec. 13, at Southsea, the wife of Dr. G. E. Dixon—a daughter.

FLEMING.—On Dec. 16, at Taunton, the wife of Dr. Donald Fleming—a son.

GRZYBOWSKI.—On Dec. 7, at Chelmsford, Dr. Betty Grzybowski (née Poland) the wife of Dr. Stefan Grzybowski—a son.

HUGHES.—On Dec. 10, at Bristol, the wife of Dr. E. B. Hughes—a daughter.

SLOAN.—On Dec. 14, at Preston, Weymouth, the wife of Dr. D. R. Sloan—a son.

MARRIAGES

JAMES—SHERLOCK.—On Dec. 15, in London, D. Geraint James, M.R.C.P., to Sheila Sherlock, F.R.C.P.

DEATHS

HUXTABLE.—On Dec. 14, in London, Arthur Edward Huxtable, M.C., M.R.C.S., of Bexhill.

MCCOMAS.—On Dec. 13, in Dorking, Cyril Henry McComas, M.D. Dubl.

MURGATROYD.—On Dec. 16, in London, Frederick Murgatroyd, M.D. Lpool, F.R.C.P.

RICHMOND.—On Dec. 16, Henry Richmond, M.B. Birm., of Standish, near Wigan, aged 64.

Appointments

CHALMERS, WILLIAM, M.B. Leeds: appointed factory doctor, Bradford, Cleckheaton district, Yorkshire.

CRAIG, A., M.B.: psychiatrist, Bellsdyke Mental Hospital, Larbert, and associated clinics.

MOORE, ROBERT, M.B. Lond., M.R.C.P.: senior medical registrar, St. Andrew's Hospital, London.

SCOULAR, G. H., M.B. Glasg., D.P.H.: administrative medical superintendent, hospitals in the Northern and Southern Ayrshire areas.

Newcastle Regional Hospital Board:

LAWS, G. J., B.A., M.B. Camb., D.P.H.: consultant pathologist, Hexham H.M.C. group.

LOUGHRAN, A. M., M.B. Edin., F.R.C.S.E.: consultant surgeon, West Cumberland H.M.C. group.

SHEPPARD, D. M., D.S.C., M.B. Edin., F.R.C.S.E., M.R.C.O.G.: asst. obstetrician and gynæcologist, Middlesbrough Maternity Hospital, North Ormesby Hospital, Sedgefield Hospital, and Stockton and Thornaby Hospital.

SMITH, H. HUNTER, M.B., D.A.: anæsthetist, East Cumberland.

WALSH, W. M., M.B. N.U.I., D.P.H.: asst. physician (infectious diseases) to the board.

WILLEY, C. B. I., M.A., B.M. Oxfd, M.R.C.P.: consultant physician, West Cumberland H.M.C. group.

Colonial Service:

BATTEN, K. L., M.B. Lond.: M.O., Uganda.

BLAKE-KNOX, P. E. A., M.B. Dubl.: M.O., Tanganyika.

BOYD, P. I., M.D. Lond., M.P.H.: M.O. (grade B, health), Trinidad.

BRYCE, J. C., M.B.: M.O., Sierra Leone.

CYWINSKI, CEZARY, M.B. Polish School of Medicine: M.O., Federation of Malaya.

EBERLIE, W. J. D., M.B. Camb., M.R.C.P.: special grade M.O., Nyasaland.

FORSTER, E. F. B., B.A., M.B. Dubl.: specialist (psychiatrist). Gold Coast.

GILBERT, W. T. M., L.R.C.P.I.: asst. director of medical services, Gold Coast.

HASSAN, B. V., M.B. Belf: M.O., Federation of Malaya.

HOWARD, A. C., M.D. Lond.: senior M.O. in charge, Zanzibar.

JELLIFFE, R. S., M.B. Lond.: M.O., Nigeria.

KARRACH, H. A., M.B. Dubl.: M.O., Uganda.

KINMAN, H. L., L.R.C.P.E.: M.O. (temporary), Nigeria.

POGONOWSKI, J. S. B., M.B. Polish School of Medicine: asst. M.O. (temporary), General Hospital, Bahamas.

STUART, EUGENE, M.B. N.U.I.: M.O., Nigeria.

SZURKAWSKI, A. S., M.B. Lond.: M.O. (temporary), Nigeria.

WOLFE, W. G., M.D.: M.O., Tanganyika.

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Notes and News

ANY QUESTIONS?

READERS of the *British Medical Journal* will know well the brains trust which appears each week under this title. Questions from all over the world are answered by a team of experts. The selection from these answers which has now been published [1] gives much practical information not to be found in textbooks. There is nothing which the team will not tackle; the sterilisation of an electric shaver, the removal of tattoo marks, and the preserving of fruit all come within their range. The book is clearly set out and bound in a convenient size for the pocket. We are sure that many doctors will be glad to have this fund of knowledge with them as they go about their work.

THE AFRICAN CHILD

AT a meeting of the Royal Society of Tropical Medicine on Dec. 13, Dr. D. B. Jelliffe, senior lecturer in medicine at University College, Ibadan, Nigeria, spoke on the African Child. Ibadan is a large city with a low standard of hygiene, and at the hospital there is ample material for study.

The African infant has a poor chance of survival. He is usually born under-weight and physiologically immature, in primitive surroundings. His umbilicus will probably become infested, perhaps with tetanus spores, and he is more than likely to have an umbilical hernia. He may be born to share his mother's (or grandmother's) milk with a brother 2 or 3 years old; and the milk may be thin, though the protein content is often unexpectedly high. Congenital syphilis and relapsing fever are common; congenital malaria no doubt occurs, and toxoplasmosis is recorded. Congenital deformities are about as common as in Europe, but in Africa they carry a special risk to life—for instance, the risk of broncho-pneumonia in severe hare-lip. If the newborn child survives the first few days he must face the three great groups of infections—namely, infections of the respiratory tract, septic infections, and infections of the gastro-intestinal tract. These are the killing diseases, and they operate on a basis of malaria before premunition has been achieved. These infections are the more deadly because, owing to malnutrition, the body cannot stand the extra strain imposed by them. The infant is dehydrated and desperately ill, and often is brought to hospital too late. Apart from breast-milk, which cannot satisfy the needs of older children, food consists of a gruel; and this may be given by hand so clumsily that it enters the trachea and lung. Dr. Jelliffe also described and illustrated infective gangrene of the mouth, which differs from cancrum oris in that it infects the bones. This terrible and destructive disease, which may strip the tissues from half the side of the face, can be cured by penicillin if treatment is started early; but in such cases, although a remarkable amount of lost tissue is replaced, there may be gross permanent disfigurement. The ætiology of this condition is not clear; but infection evidently plays a large part, and no doubt the malnourishment of the tissues is a major factor. The infant-mortality rate is estimated at about 300–500 per 1000 live births. Dr. Jelliffe painted a sad picture; but this is relieved by signs of a desire for more education on the part of the African mothers.

D.D.T.-RESISTANT LICE IN KOREA

THE U.S. army medical service, in coöperation with the U.S. department of agriculture, has developed for use in Korea new insecticides capable of controlling Korean body-lice which are resistant to D.D.T. New preparations of lindane and pyrethrum powder are being used to protect troops against louse-borne epidemic typhus which might be introduced by infected North Korean and Chinese prisoners-of-war. Both substances are highly effective against the Korean louse and are safe for human use. They will also be used to disinfect prisoners-of-war and civilians when further supplies are available.

As far as is known, D.D.T. is still effective against lice and other insects in most other areas of the world. Both lindane and pyrethrum are actually less potent than D.D.T. against lice in the United States. The U.S. army medical service proposes to carry out a survey to determine the extent of immunity to D.D.T. in insects and other disease-carriers in many countries.

1. Any Questions? London: B.M.A., Tavistock Square, London, W.C.1. 1951. Pp. 240. 7s. 6d.

United Nations forces have been relatively untroubled by the stubborn Korean louse—principally because of the work of preventive medicine companies, and the strict sanitary discipline in the field. Routine immunisation against epidemic typhus has given additional protection.

A FILM ON VACCINATION

THE Ministry of Health has had a film made to encourage the vaccination of children in infancy. *Surprise Attack* tells something of a little girl's smallpox and the doctors' steps to limit an epidemic. It is well made and deserves showing in public cinemas and to parents' and teachers' groups, and also in medical and nursing schools to illustrate the set lecture on the subject. The film (running-time 10 minutes) is available from the Central Film Library, 4, Great Russell Street, W.C.1.

University of Oxford

Dr. Wilson A. Swanker, of New York, will lecture at the Radcliffe Infirmary, Oxford, on Monday, Jan. 7, at 8 P.M., on the Use of Gelatinised Bone in the Repair of Skeletal Defects.

University of Cambridge

Raymond Horton-Smith prize.—This prize for 1950–51 has been awarded to Dr. H. R. Jolly. *Proxime accessit:* Dr. J. A. R. Miles.

University of London

Dr. C. F. Harris, dean of St. Bartholomew's Hospital Medical College, has been appointed representative of the faculty of medicine on the senate for the remainder of the period 1950–54, in place of the late Mr. J. B. Hunter.

University of Durham

On Dec. 14, the following degrees were conferred:

M.B., B.S.—J. R. B. Ball, E. I. Blenkinsop, Robert Bruce, G. Y. Caldwell, A. I. A. Charlton, Z. H. Cywicki, James Dixon, John Fitzgerald, Joyce H. Hindmarsh, Walter Holmes, W. E. J. Kirby, P. H. D. Lewars, J. B. Lilly, Jean M. McIvor, J. F. Mather, F. C. Pickering, I. R. Pyle, J. B. Richardson, T. M. C. Saint, W. A. Shiells, Margaret Sibson, Henry Tubmen.

University of Liverpool

At recent examinations the following were successful:

M.D.—K. McCarthy, I. P. Madhok, H. Roberts.

M.Ch.Orth.—W. J. Betts, P. Chandra, K. R. Daymond, G. F. Fischer, F. J. Gruar, D. R. Gunn, A. K. Gupta, M. Natarajan, J. A. O'Garra, J. S. Roarty, I. W. Winchester, W. H. de W. de Wytt.

University of Manchester

At recent examinations the following were successful:

Final M.B., Ch.B.—J. R. Jaffe, D. W. Preston (old regulations); James Ashworth, F. N. Bamford, Freda A. Broadhurst, Barbara Clough, E. M. Coates, John Cragg, Lawrence Duggan, J. H. A. Dwek, Margaret J. Foulds, Patrick Fulton, P. W. Gilman, T. T. Glancy, E. N. Gold, Dorothy M. Gratton, P. G. Haddock, C. S. Hajikakou, E. G. R. Jones, R. J. Laude, J. B. Law, B. E. Marks, G. H. Mazey, Elsa M. Mellor, G. W. H. Oldfield, Leon Poller, H. J. Reynolds, G. B. Ross, Derek Rothwell G. J. Ryder, Frederick Smith, G. F. Smith, O. T. Taylor, P. R. Ward, W. A. Whittaker, Allan Withnell (new regulations).

D.P.M.—H. S. Coulsting, M. M. Lidgate, Edith M. Thorp.

University of Edinburgh

On Dec. 14 the following degrees and diplomas were conferred:

M.D.—R. M. Fulton, A. R. Somner (highly commended); *P. F. de Caires, *C. E. L. Haffner, *Thomas Harrison, Harry Oswald-Smith, A. S. L. Rae.

Ph.D. (in the faculty of medicine).—Deb Prasanna Basu, A. S. Outschoorn.

M.B., Ch.B.—Audrey N. H. Andrew, W. R. C. Andrew, E. S. Blackadder, F. K. P. Brydon, R. C. Buchanan, Isobel C. Campbell, G. M. Dewar, J. M. P. Dippenaar, W. F. M. Dorward, P. T. Fraser, P. W. E. Hayward, R. S. Jaremа, J. H. Jennings, D. F. Kerr, Margaret L. Liddell, D. W. Lyon, Mary I. McArthur, Ranald Macdonald, M. A. McFadyen, D. W. Maxa, A. E. Meek, C. C. Moir, G. D. E. Morris, J. E. Munro, A. E. M. Reekie, W. D. Riddell, A. A. Robertson, A. H. I. Scott, W. A. Simpson, R. M. Stewart, J. H. Sutherland, G. P. Syme-Thomson, J. M. Tainsh, Jean C. Taylor, C. G. M. Third, F. A. Viapree, F. E. B. Wills, *Margaret J. Field.

D.M.R.-D.—Alan Lien-yiu Chen, J. M. McKay, Mihir Kumar Mitter.

D.M.R.-T.—W. D. Rider.

* In absentia.

Dr. John Crofton has been appointed to the chair of tuberculosis and diseases of the respiratory system.

Dr. Crofton, who qualified in 1936, graduated M.B. Camb. in 1937. After holding house-appointments at St. Thomas's Hospital and a registrarship at the Brompton Hospital, he joined the scientific staff of the Medical Research Council, later becoming senior medical assistant at the Institute for Diseases of the Chest. During the war he served in the R.A.M.C. with the rank of lieut.-colonel. At present he is physician to Hammersmith Hospital and lecturer in diseases of the chest at the Postgraduate Medical School of London. He is also chief clinical assistant at the Brompton Hospital. His published work deals chiefly with the use of streptomycin in the treatment of pulmonary tuberculosis. He took his M.D. in 1947 and he was elected F.R.C.P. this year.

Under the will of Dr. Colin Gordon, of St. Saviour, Jersey, the university is to receive some £60,000 which will be used to found research scholarships in medicine and science. Dr. Gordon graduated at Edinburgh in 1889.

University of Glasgow

On Dec. 5, the degree of doctor of medicine was conferred in absentia by diploma upon John Vaughn.

Royal College of Surgeons of England

At a meeting of the council on Dec. 13, with Sir Cecil Wakeley, the president, in the chair, Hunterian professorships were awarded to Mr. R. F. Phillips, of New York, for a lecture on Neuroblastoma and to Prof. Naguib Makar Bey, of Cairo, for a lecture on Pathogenesis of Cancer in the Bilharzial Bladder. For 1952 Mr. P. H. Mitchiner was appointed Bradshaw lecturer; Mr. V. Zachary Cope, Thomas Vicary lecturer; and Mr. St.J. D. Buxton, Robert Jones lecturer. Prof. George Perkins was appointed Robert Jones lecturer for 1953.

The following diplomas were granted:

F.R.C.S.—I. M. Shulman, G. D. Elphick, S. G. Griffin, D. E. Macrae, Denis Bartlett, H. G. Stack, A. C. Hicks, K. A. McNeill, J. R. Wilson, Paul Dawson-Edwards, H. B. Jacobs, J. P. Partridge, G. H. Bancroft-Livingston, T. J. S. Patterson, G. L. Bunton, Percy Weinstein, R. A. Denham, J. M. Kodicek, A. H. C. Ratliff, Grace M. Lukose, A. H. Levy, D. H. K. Soltau, Gnaneshwar Rao Baji L. D. Abrams, F. J. P. O'Gorman, Sachindranath Roy, C. F. Chapple, E. I. H. Mason, W. S. Smith, Kandiah Vythilingam, Prins Dharmaratnam Rajaratnam, Eliasz Zwiefach, L. J. McF. Black, S. R. Taitz, D. J. du Plessis, P. L. McNeil, B. I. H. McPherson, Abdur Rahim, N. R. Scott-Young, R. A. Hill, R. M. Laird, C. B. Noble, Norman Slade, Stevens Dimant, Ibrahim El-Wakil, K. V. J. Kearney, A. H. MacLean, Terence McSweeney, W. E. Swaney, Ronald Hunter, Raouf Guindy Abo-Seif, D. E. Bolt, S. A. Cabraal, G. R. Carr, P. H. Dickinson, G. E. Flatman, E. H. Hadfield, W. F. Herlihy, J. S. Hopkirk, Narayan Laxman Kalle, Narayan Dattatray Kamat, J. L. Swann, J. G. Callanan, Arvind Purshottam Desai, D. M. Forrest, Mohammed Monazeral Hasan, M. R. Kliman, J. A. McCredie, P. P. McGarry, Ahmad Abdel Khalik Motawi, Robert Owen, J. C. Parr, D. W. Purser, J. B. Pyper, R. A. Bremner, Tara Chandra, Homi Nasservanji Dastur, Noor Ellahee, Granville Freeman, Iris Kane, J. F. Mullan, R. C. Read, D. B. Rogers, J. E. M. Smith, J. A. Snell, Harold Ellis, A. D. Hodge, I. M. Maresky, S. H. Watson, A. M. Wiley.

M.R.C.S.—L. D. Abrams.

Conjoint Board in Ireland

At recent examinations the following were successful:

D.C.H.—V. Barry, D. C. J. Carter, G. Cremer, C. P. Nanavati, W. P. O'Keeffe, K. J. Quinn, Carmel P. Ryan.

D.A.—C. A. G. Armstrong, J. C. Clarke, Patricia Delany, E. A. Frayworth, L. McArdle, J. A. McNeilly, Patricia O'Neill, J. H. Tyrrell, N. Zwick.

Register of Chiropodists

The Board of Registration of Medical Auxiliaries have now published the 1951 register of chiropodists. Copies may be had from the secretary of the board, B.M.A. House, Tavistock Square, London, W.C.1.

Osler Club

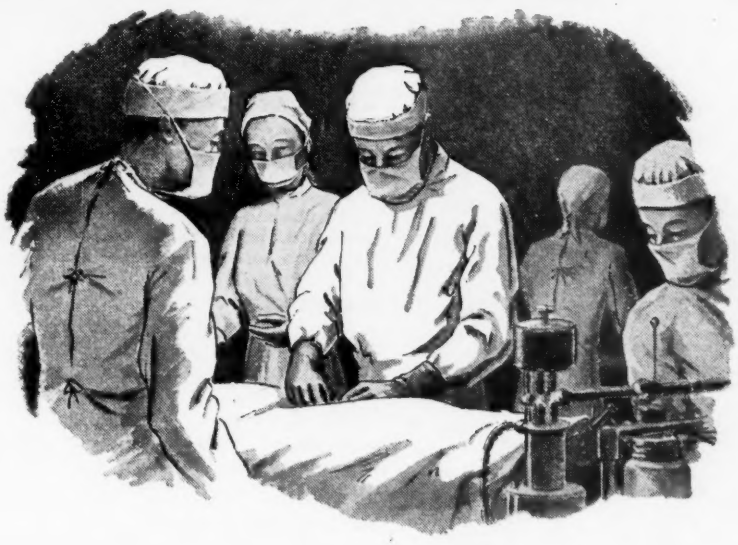
A symposium on the history of pneumonia will be held on Friday, Jan. 11, at 7.45 P.M., at 11, Chandos Street, London, W.1. Lord Horder will speak on Osler and Pneumonia, Sir Lionel Whitby on the Advent of the Sulphonamides, and Sir Adolphe Abrahams on the Changing Character of the Disease.

Blood Donors

During the September quarter this year 24,670 new donors joined the National Blood Transfusion Service in England and Wales, bringing the total to 453,483—the highest since the war. Even so, another 172,000 donors are needed.

Salary Increase for Hospital Administrators

The Industrial Court has increased the salary scales of senior administrative officers employed by hospital authorities in the National Health Service. About 2200 employees will be affected. Under the new scales the lowest salary the secretary of a hospital management committee can receive will be £745 (£640 on present scale) and the highest £1900 (£1700). Other rises are: secretary of a board of governors of an undergraduate teaching hospital £1850 (£1750) to £2250 (£2000); secretary of a Metropolitan regional hospital board £1600 (£1400) to £2100 (£1700). The increases are less than the staff side claimed, but more than the management side offered.



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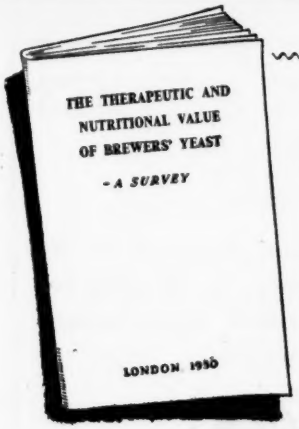

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J. Amer. med. Ass. (1948) **138**, 1150–3. Lancet (1951) **2**, Oct. 6, 614.
Rev. Med. Bourgogne (1951) **6**, 187. Schweiz. Zschr. Fur Tub. (1950) **71**, 27–41.

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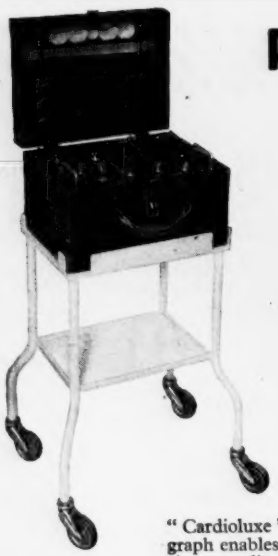

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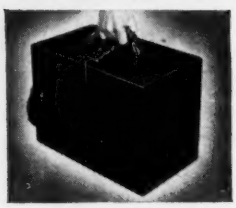

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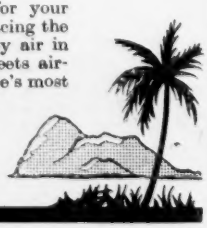

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A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Six acres of ground, facing Finsbury Park. Voluntary and Temporary Patients received without certification. **Insulin Coma Unit.** E.C.T. Group Psychotherapy. Trained Resident and Visiting Staff.
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MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres
In the same grounds, **ROWDENS**, a comfortable house with lovely views. Private road to the beach
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A Registered Hospital for MENTAL DISEASES and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales

The object of this Hospital is to provide the most efficient means for the treatment and care of patients of both sexes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by Trustees. Deep and Modified Insulin Coma; E.C.T., and Psychotherapeutic treatment given. VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS RECEIVED.

For Terms and further information apply to the MEDICAL SUPERINTENDENT *Telephone*: **GATLEY 2231**

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A Private Home for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern house, 12 miles from Marble Arch, in attractive secluded grounds. Patients treated under Certificate, Temporary or Voluntary status. Modern forms of treatment, including psychotherapy, narco-analysis, modified insulin, occupational therapy, E.C.T., etc. Fees from 12 guineas a week.

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Academic and Educational

ELECTRO-ENCEPHALOGRAPHY

A Course for Postgraduates in the technique and clinical application of Electro-encephalography will be held jointly at the Institutes of Psychiatry and Neurology from 7TH JANUARY–15TH MARCH, 1952.

For further particulars apply to the Dean, Institute of Psychiatry, Maudsley Hospital, Denmark-hill, S.E.5, or the Dean, Institute of Neurology (Queen Square), The National Hospital, Queen-square, W.C.1.

INSTITUTE OF CHILD HEALTH
UNIVERSITY OF LONDON

RECENT ADVANCES IN SURGERY OF INFANCY AND CHILDHOOD

A course of Lectures for Postgraduates will be given at The Hospital for Sick Children, Great Ormond-street, London, W.C.1, during JANUARY-MARCH, 1952, on THURSDAYS at 5 P.M.

24th January	Surgery of the Brain in Childhood	Prof. H. CAIRNS
31st January	Surgery in the Newborn	Mr. DENIS BROWNE
7th February	Abdominal Surgery in Childhood	Prof. I. AIRD
14th February	Burns	Mr. A. B. WALLACE
21st February	Patent Ductus Arteriosus and Pulmonary Stenosis	Mr. T. HOLMES SELLORS
28th February	Plastic Surgery	Mr. D. N. MATTHEWS
6th March	Modern Orthopædic Principles	Mr. H. J. SEDDON
13th March	The Ear, Nose, and Throat	Mr. H. S. SHARP
20th March	Genito-urinary Surgery	Mr. T. T. HIGGINS
27th March	Surgery of Chest Disease	Prof. R. S. PILCHER

The fee for the course of 10 lectures is £3 3s., for a single lecture 7s. 6d.

Applications for tickets of admission, accompanied by a remittance, should be sent to the Secretary, Institute of Child Health, The Hospital for Sick Children, Great Ormond-street, London, W.C.1. Early application is advisable as the number of tickets is limited.

THE UNIVERSITY OF MANCHESTER
FACULTY OF MEDICINE

The Faculty of Medicine, in conjunction with the St. Mary's Hospitals for Women and Children, proposes to conduct a POSTGRADUATE COURSE IN OBSTETRICS, especially intended for general practitioners. The course is to comprise 12 weekly meetings to be held on WEDNESDAYS from 10 A.M.–4 P.M., commencing 19TH MARCH, 1952, and concluding on 18th June, 1952.

The fee for the course is 7 guineas, though doctors taking part in the National Health Service may be able to claim the fee and travelling expenses from the Ministry of Health.

Application should be made to the Dean of Postgraduate Medical Studies not later than 29th February, 1952.

INSTITUTE OF ORTHOPÆDICS

COURSE IN THERAPEUTICS—18TH–26TH FEBRUARY, 1952

Monday, 18th February—Town Section

10.00 A.M.–11.00 A.M.	Rest	Mr. H. J. BURROWS
11.15 A.M.–12.30 P.M.	Movement	Mr. H. J. BURROWS
12.45 P.M.	Lunch	
2.00 P.M.–3.00 P.M.	Manipulation	Mr. R. Y. PATON

Tuesday, 19th February—Country Section

10.00 A.M.–11.00 A.M.	Orthopædic Appliances	Mr. J. A. CHOLMELEY
11.15 A.M.–12.15 P.M.	Orthopædic Appliances	Mr. W. TUCK
12.45 P.M.	Lunch	
2.00 P.M.–4.00 P.M.	Clinical Demonstration	Mr. H. J. SEDDON
4.00 P.M.	Tea	

Wednesday, 20th February—Country Section

10.00 A.M.–11.00 A.M.	Plaster-of-paris Technique	Mr. F. J. HEDDEN
11.15 A.M.–12.30 P.M.	Chemotherapy	Dr. F. H. STEVENSON
12.45 P.M.	Lunch	
2.00 P.M.–3.45 P.M.	Clinical Demonstration	Mr. A. T. FRIPP
4.00 P.M.	Tea	
4.15 P.M.–5.15 P.M.	Chemotherapy	Dr. C. H. LACK

Thursday, 21st February—Town Section

10.00 A.M.–12.30 P.M.	Principles in Treatment of Fractures	Mr. D. TREVOR
12.45 P.M.	Lunch	
2.00 P.M.–3.00 P.M.	Operative Exposure of Bones and Joints	Mr. J. I. P. JAMES
3.00 P.M.–4.00 P.M.	Operative Surgery of the Hand	Mr. J. I. P. JAMES
4.00 P.M.	Tea	
4.15 P.M.–5.15 P.M.	Plastic Surgery in Orthopædics	Mr. D. N. MATTHEWS

Friday, 22nd February—Town Section

10.00 A.M.–12.30 P.M.	Use and Abuse of Metal for Internal Fixation	Mr. K. I. NISSEN
12.45 P.M.	Lunch	
1.45 P.M.–2.45 P.M.	Arthrodesis	Mr. V. H. ELLIS
3.00 P.M.–4.00 P.M.	Arthroplasty	Mr. P. H. NEWMAN
4.00 P.M.	Tea	

Saturday, 23rd February—Town Section

10.00 A.M.–11.30 A.M.	Plastic Surgery in Orthopædics	Mr. D. N. MATTHEWS

Monday, 25th February—Town Section

10.00 A.M.–NOON	Clinical Demonstration (Nerve Injuries Clinic)	Mr. D. M. BROOKS
12.45 P.M.	Lunch	
2.00 P.M.–4.00 P.M.	Pathological Demonstration	Dr. A. D. THOMSON
4.00 P.M.	Tea	

Tuesday, 26th February—Country Section

10.00 A.M.–NOON	Tendon Transplantation	Mr. D. M. BROOKS
12.45 P.M.	Lunch	
2.00 P.M.–4.00 P.M.	Treatment of Poliomyelitis	Mr. H. J. SEDDON
4.00 P.M.	Tea	

The fee for the course (including lunch and tea) is 10 guineas.

Early application should be made to the Dean at 234, Great Portland-street, London, W.1.

UNIVERSITY COLLEGE OF THE WEST INDIES. LECTURESHIP IN CHEMICAL PATHOLOGY. Applications are invited for the post of Senior Lecturer or Lecturer in the Department of Pathology. The duties of the post will include chemical pathological work for the University College Hospital and instruction in chemical pathology of students working for the medical degrees of the University of London. The salary scale is £1200–£50–£1600 for Senior Lecturer and £800–£50–£1200 for Lecturer: the point of entry in the scale is determined by qualifications and experience. Candidates with a medical degree are preferred but applications are invited from non-medical graduates. Child allowance is paid and also a temporary cost-of-living allowance. Superannuation is under F.S.S.U. arrangements. Unfurnished accommodation is available at a rent of 5% of basic salary.

Applications (12 copies), giving full particulars of qualifications, and the names of 3 referees, should be received by 7th January, 1952, by the Secretary, Senate Committee on Higher Education in the Colonies, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

NATIONAL BIRTHDAY TRUST FUND, 57, Lower Belgrave-street, London, S.W.1. Applications are requested from registered medical practitioners for the post of DIRECTOR of an Inquiry into Prematurity. Appointment for 1 year in the first place. Salary £1100, or part-time appointment might be considered.

Applications, with details of qualifications, experience, and 3 testimonials, to the Secretary at the above office by 31st January, 1952.

NEW YORK. ALBANY HOSPITAL, associated with ALBANY MEDICAL COLLEGE. FELLOWSHIP IN TUBERCULOSIS available at above, beginning 1st July, 1952, for a period of 12 months.

Apply Albany Hospital, Albany, New York.

Hospital Services : Senior Appointments
(See Note under Appointments, p. 123! of Text.)

HIGHLANDS HOSPITAL, Winchmore-hill, N.21. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Part-time ASSISTANT PHYSICIAN in the Department of Physical Medicine for 7 half-days a week. Salary scale £1300–£1750 p.a. This Hospital, which has some 818 Beds, has a small number of general medical and surgical beds, a large orthopædic unit and all the usual special departments. The Hospital is in process of reorganisation as a district general hospital.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 2nd February, 1952. Candidates are invited to visit the Hospital by direct appointment with the Medical Superintendent.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. HORNSEY CHILD GUIDANCE CLINIC, "The Priory," Priory-road, N.8. Applications are invited from suitably qualified medical practitioners with relevant experience for the appointment of Part-time CHILD PSYCHIATRIST to be in charge of the above Clinic for 4 half-days a week. Salary scale £1300–£1750 p.a. The successful candidate will be in the employment of the Board but the child guidance service will be administered by the Education Department of the Middlesex County Council.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 26th January, 1952.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the full-time appointment of an ASSISTANT RADIOTHERAPIST, commencing salary £1300–£50–£1750 p.a. Candidates must hold a Diploma in Medical Radiology.

Forms of application are obtainable from the House Governor to whom applications, together with copies of 3 recent testimonials, should be sent not later than 28th January, 1952.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments as CONSULTANT ORTHOPÆDIC SURGEON (part-time), 9 notional half-days a week each.

(1) To the Greenwich and Deptford group of hospitals;
(2) To the Lewisham and the Sidcup and Swanley groups of hospitals.

Candidates must have had a wide experience in orthopædic surgery and be Fellows of a Royal College of Surgeons. The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1. The last day for acceptance of applications will be 11th January, 1952, and selected candidates will be interviewed in London on 7th February, 1952.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as CONSULTANT PHYSICIAN to the Lewisham group of hospitals, for 6 notional half-days a week. Candidates must have had wide experience in general medicine and be members of a Royal College of Physicians. The possession of a higher degree in medicine is desirable. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment, and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1. The last day for acceptance of applications will be 18th January, 1952.

Provincial

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT PATHOLOGIST (whole-time or maximum part-time) for hospitals in the Peterborough and King's Lynn areas. The main centre will be at the central laboratory in the Peterborough Memorial Hospital but duties will include also the direction of laboratories in some peripheral hospitals, of which those at King's Lynn, Stamford, and Wisbech are the chief. Special experience in hæmatology and serology desirable.

Applications (8 copies), stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, should reach the undersigned not later than 7th January, 1952. Candidates are invited to visit the hospitals by direct arrangement with the Hospital Management Committee Secretary, Peterborough Memorial Hospital.

K. V. F. MORTON, Secretary.

117, Chesterton-road, Cambridge.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for appointment of Whole-time ASSISTANT PSYCHIATRIST to Birmingham (Mental C) group; duties at Highcroft Hall Hospital, Birmingham (1225 Beds). Accommodation available. Salary scale £1300–£50–£1750 p.a. Applicants should possess D.P.M. Appointment subject to National Health Service superannuation regulations.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 7th January. Candidates may visit Hospital.

BIRMINGHAM REGIONAL HOSPITAL BOARD AND DUDLEY COUNTY BOROUGH COUNCIL. Applications invited for joint appointment of Whole-time CONSULTANT CHEST PHYSICIAN, Dudley and Stourbridge group of hospitals and Dudley County Borough Council; duties mainly at Tuberculosis Dispensary, Dudley, and also at Prestwood Sanatorium, The Limes Sanatorium, Himley, and Edge View, Kinver, with charge of Chest Investigation Ward at Wordsley Hospital (12 Beds). Wide experience in specialty essential and possession of higher medical qualification an advantage. 9/11ths of time will be devoted to hospital and clinic work, the responsibility of the Board, and 2/11ths to prevention and after-care in tuberculosis, the responsibility of the Dudley County Borough Council. Remuneration for local authority work will be determined in the light of agreement to be negotiated; appointment subject to National Health Service (Superannuation) Regulations, 1950.

Applications (15 copies), stating name, date of birth, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 7th January. Candidates may visit the Sanatoria and Hospital concerned.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for following part-time Consultant appointments:—

(*a*) THORACIC SURGEON (4 notional half-days weekly), Wolverhampton group; duties mainly at Royal Hospital, Wolverhampton (310 Beds).

(*b*) THORACIC SURGEON (9 notional half-days weekly): Birmingham (Sanatoria) and Mid-Worcestershire groups; duties mainly at Yardley Green Hospital, Birmingham (413 Beds) and also at Regional Thoracic Surgical Centre, Hill Top Hospital, Bromsgrove (76 Beds).

Applicants should possess higher surgical qualification. Wide experience in specialty essential. Appointment subject to National Health Service superannuation regulations.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Edgbaston, Birmingham, 15, before 7th January, 1952. Candidates for both appointments should forward 25 copies of applications. Candidates may visit hospitals concerned.

BIRMINGHAM REGIONAL HOSPITAL BOARD AND WOLVERHAMPTON COUNTY BOROUGH COUNCIL. Applications invited for joint appointment of Whole-time ASSISTANT CHEST PHYSICIAN to the Wolverhampton group and Wolverhampton County Borough Council; duties at hospitals and clinics in the Wolverhampton area. Salary £1300–£50–£1750. Successful candidate will devote 9/11ths of time to hospital and clinic work the responsibility of the Board, and 2/11ths of time to prevention and after-care work for the County Borough of Wolverhampton. Appointment subject to National Health Service (Superannuation) Regulations, 1950.

Applications (15 copies), stating name, date of birth, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 7th January, 1952. Candidates may visit hospitals and clinics concerned.

NEWCASTLE REGIONAL HOSPITAL BOARD. NEWCASTLE HOSPITAL MANAGEMENT COMMITTEE GROUP. SENIOR PHYSICIAN (Consultant) for General Medical Clinic No. 1. Whole-time or part-time for 9 notional half-days. Salary scale £1700–£2750 whole-time, pro rata part-time. The Physician appointed will be required to reside in Newcastle. Canvassing will disqualify but candidates are invited to see the hospitals by arrangement with the Senior Physician, Newcastle General Hospital.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, to be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners, preferably holding a higher qualification in psychiatry, for the whole-time post of ASSISTANT PSYCHIATRIST at the Saxondale Hospital, Radcliffe-on-Trent, Notts. A house on the Hospital estate is available for the successful candidate. Salary scale £1300–£50–£1750 p.a.

Application forms and further particulars may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms should be returned to the Secretary not later than 26th January, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners, preferably holding a higher qualification in psychiatry, for the whole-time post of ASSISTANT PSYCHIATRIST who will be attached to the Middlewood Hospital, Sheffield (1788 Beds). A house is available for the successful candidate. Salary scale £1300–£50–£1750 p.a.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, and returned to the Secretary not later than 19th January, 1952.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified registered medical practitioners for the whole-time post of CONSULTANT PATHOLOGIST-IN-CHARGE of the City General Hospital Laboratory, Sheffield. The laboratory is a modern one, with facilities for all types of pathological work, and with a large animal house. A Pregnancy Diagnosis Centre for the North of England is now in operation. The Hospital has a Thoracic Surgical Unit and a Professorial Medical Unit; a Regional Cardiological Centre and a Professorial Gynæcological Unit will be opened in the immediate future. There are 3 subsidiary laboratories at other hospitals. Candidates must have had extensive experience in all branches of pathology, and should have a special interest in morbid anatomy and histology. The successful candidate will be required to reside within 10 miles of the City General Hospital.

Application forms and further particulars may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms should be returned to the Secretary, not later than 19th January, 1952.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. UXBRIDGE CHILD GUIDANCE CLINIC, 255/6, High-street, UXBRIDGE, MIDDLESEX. Applications are invited from suitably qualified medical practitioners with relevant experience for the appointment of Part-time CHILD PSYCHIATRIST to be in charge of the above Clinic for 3 half-days a week. Salary scale £1300–£1750 p.a. The successful candidate will be in the employment of the Board but the child guidance service will be administered by the Education Department of the Middlesex County Council.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 26th January, 1952.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. TWICKENHAM CHILD GUIDANCE CLINIC, 58, Hampton-road, TWICKENHAM. Applications are invited from suitably qualified medical practitioners with relevant experience for the appointment of Part-time CHILD PSYCHIATRIST, to be in charge of the above Clinic for 4 half-days a week. Salary scale £1300–£1750 p.a. The successful candidate will be in the employment of the Board but the child guidance service will be administered by the Education Department of the Middlesex County Council.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 26th January, 1952.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time CONSULTANT PSYCHIATRIST at Oakwood Hospital, Maidstone, Kent. Candidates should possess a D.P.M. and preferably a higher qualification; psychiatric hospital and outpatient clinic experience is essential, and candidates should have had experience in modern psychiatric therapeutic procedures, including psychotherapy and occupational therapy. A house will be available.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1. The last day for acceptance of applications will be 11th January, 1952, and selected candidates will be interviewed in London on 11th February, 1952. Applicants may visit the Hospital.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ASSISTANT CHEST PHYSICIAN to the Brighton and Lewes group of hospitals. Duties are mainly in connection with Tuberculosis Clinics, but there is an opportunity for association with inpatient beds and with preventive medicine in the specialty. Applicants must have had previous experience in chest diseases, and a higher qualification in medicine, a diploma of membership of a Royal College of Physicians or a Diploma in Public Health would be an advantage. Salary within the scale £1300–£50–£1750. Applicants may visit the Clinics.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment, and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1. The last day for acceptance of applications will be 18th January, 1952.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT CHILD PSYCHIATRIST to work under the Consultant Child Psychiatrist, in the Hampshire Child Guidance Service. Salary scale £1300–£50–£1750 p.a. The successful candidate will be required mainly to act as Psychiatrist at the various Child Guidance Clinics, in collaboration with the Hampshire Education Committee, centred in Winchester with branches at Aldershot, Petersfield, Havant, Gosport, Christchurch, Andover, and Basingstoke. There is a team of 2 educational psychologists and social workers. The candidate appointed will also be required to examine and advise on children and young people referred for advice by Juvenile Courts or otherwise admitted to Remand Homes, of which there are 3 in the area.

Applications (5 copies), stating date of birth, qualifications, experience, and present appointment(s), and giving the names and addresses of 3 referees, should be made by letter and sent to the Secretary (S.D.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, to arrive not later than 19th January, 1952. Applicants may visit the appropriate Clinics and Centres by arrangement with the County Medical Officer of the Hampshire County Council.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of a Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale) to serve the Newport and East Monmouthshire Hospital Management Committee. He will work mainly at the Royal Gwent Hospital, Newport, Mon. (259 Beds), but will be expected to visit other hospitals in the area. The successful candidate should preferably be in possession of the Diploma in Anæsthetics and will be required to work in association with Consultants based on the Group.

Applications (12 copies), stating date of birth, giving a summary of qualifications, experience, previous appointments with dates, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of a CONSULTANT ORTHOPÆDIC AND TRAUMATIC SURGEON to serve the Mid-Glamorgan Hospital Management Committee group. He will be based at the General Hospital, Neath. Candidates are asked to state whether they wish to be considered for a whole-time or maximum part-time appointment.

Applications (12 copies), stating date of birth, giving a summary of qualifications, experience, previous appointments with dates, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

JAMAICA. WEST INDIES UNIVERSITY COLLEGE HOSPITAL (UNIVERSITY OF LONDON). Applications are invited for the post of RADIOLOGIST to the University College Hospital at an annual salary of £1750, with additional emoluments for teaching estimated at £250 p.a. The appointment will be full-time and the holder of the post will contribute 5% of his salary to a superannuation scheme to which the Hospital also contributes. First-class passages to Jamaica will be provided on first appointment with a reasonable allowance for freight and personal effects.

Applications (10 copies), together with the names of 3 referees, should be received by the Secretary, Senate Committee on Higher Education in the Colonies, University of London, Senate House, W.C.1, before 7th January, 1952.

NEW ZEALAND. WAIKATO HOSPITAL BOARD. Applications closing on 25th February, 1952, are invited from qualified medical practitioners for the full-time position of ANÆSTHETIST at the Waikato Hospital, Hamilton, New Zealand. Salary according to qualifications and experience as follows:—

Senior Specialist grading: minimum £1500, maximum £1750 p.a. Annual increments £50, plus cost-of-living bonus of £160 p.a. Non-resident.

Junior Specialist grading: minimum £1100, maximum £1400 p.a. Annual increments £50, plus cost-of-living bonus of £160 p.a. Non-resident.

Conditions of appointment obtainable from the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Transport expenses of successful applicant and of wife and dependent children, if resident in United Kingdom at the time of appointment, payable as per conditions of appointment.

Applications, with copies of recent testimonials, stating age, qualifications, and experience, to be addressed to—

A. C. BURGESS, Secretary.

P.O. Box 14, Hamilton, New Zealand.

Hospital Services: Junior Appointments

(See Note under Appointments, p. 1231 of Text.)

CONNAUGHT HOSPITAL, Walthamstow, E.17. Clinical ASSISTANT required in the Psychiatric Department of Connaught Hospital for 1 session per week Friday P.M. Salary in accordance with paragraph 10 (*b*) of National Health Service conditions—i.e., £175 a year for each weekly notional half-day.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group (No. 11), Langthorne-road, Leytonstone, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Clinical ASSISTANT required in the Department of Physical Medicine at Connaught Hospital for 2 sessions per week on Tuesday and Friday mornings. Salary in accordance with paragraph 10 (*b*) of National Health Service conditions—i.e., £175 a year for each weekly notional half-day.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group (No. 11), Langthorne-road, Leytonstone, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Clinical ASSISTANT required in the Orthopædic Department at Connaught Hospital for 2 outpatient sessions per week on Monday and Friday afternoons. Salary in accordance with paragraph 10 (*b*) of National Health Service conditions—i.e., £175 a year for each weekly notional half-day.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group (No. 11), Langthorne-road, Leytonstone, E.11.

HIGHLANDS HOSPITAL, Winchmore-hill, London, N.21. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON now vacant. 6 months appointment.

Applications, with copies of 3 testimonials, to be sent to the Deputy Secretary, Northern Group Hospital Management Committee, Royal Northern Hospital, Holloway, London, N.7, from whom forms of application may be obtained.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (General—313 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON. The appointment is for 6 months only, and the salary, depending upon the number of previous posts held, £350, £400, or £450 p.a., less residential charge of £100 p.a.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, should reach the Assistant Secretary of the Hospital by 9th January, 1952.

DULWICH HOSPITAL, East Dulwich-grove, S.E.22. CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. Applications invited for appointment as HOUSE OFFICER (surgical duties), position vacant from 19th January, 1952. Salary £350–£450 a year, according to posts held, with deduction at rate of £100 a year in respect of residence. Appointment tenable for 6 months in first instance.

Applications, stating age, qualifications, and experience, enclosing copy testimonials, to the Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, S.E.22, as soon as possible.

FINCHLEY MEMORIAL HOSPITAL. Resident House SURGEON required to commence duty on 1st January, 1952.

Applications, stating age, experience, and names of referees, &c., to be sent to House Governor, 1, Wellhouse-lane, Barnet, Herts.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SOUTH WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (first, second, or third post) to Casualty, Orthopædic, and Fracture Departments, vacant now.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials, to the Secretary of the Committee, West Middlesex Hospital, Isleworth, Middlesex. Closing date 8th January, 1952.

LEWISHAM HOSPITAL, London, S.E.13. Lewisham GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Orthopædics and Trauma. Resident preferred but not essential. The appointment is vacant immediately and is tenable for 1 year.

Applications, stating age, qualifications, and experience, with names of 3 referees, should be addressed to the Secretary, Group Offices, Lewisham Hospital, London, S.E.13.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9. Applications are invited from registered medical practitioners for the appointment of PSYCHOTHERAPIST (part-time), 2–4 half-days a week. The appointment will be, in the first instance, for 1 year with grading as Senior Registrar.

Applications, with copies of 3 recent testimonials, should reach the Secretary by 10th January, 1952.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—147 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON. The appointment is for 6 months only and the salary depending upon the number of previous posts held, £350, £400, or £450 p.a., less residential charges of £100 p.a.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should reach the Assistant Secretary of Hospital by 9th January, 1951.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of SENIOR REGISTRAR to the Department for Diseases of the Nervous System. Applicants must hold the M.R.C.P. and have had previous neurological experience. Appointment is non-resident and until 31st December, 1952, in first instance.

Forms of application are obtainable from the Deputy Superintendent and should be submitted, with names of 3 referees, by 12th January.

MILE END HOSPITAL, Bancroft-road, E.1. (450 Beds.) HOUSE PHYSICIAN (first, second, or third), required to commence 29th January, 1952, for 6 months.

Application forms, to be returned by 5th January, 1952, with copies of not more than 3 testimonials, may be obtained from the Physician-Superintendent.

MILE END HOSPITAL, Bancroft-road, London, E.1. (450 Beds.) SENIOR HOUSE OFFICER (Casualty Department), resident or non-resident. Required for duty on 2nd February, 1952, for 12 months.

Application forms, which should be returned by 5th January, 1952, with not more than 3 testimonials, may be obtained from the Physician-Superintendent.

PADDINGTON HOSPITAL, Harrow-road, W.9. Padding-TON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN for the T.B. Wards (50 Beds) at Paddington Hospital, 285, Harrow-road, W.9, for duty 1st February, 1951. This post provides facilities for studying for higher degree. Salary and conditions of service as for hospital medical and dental staffs.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Secretary to the Committee by 7th January, 1952.

PADDINGTON HOSPITAL, 285, Harrow-road, W.9. PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer) at above Hospital. The appointment is tenable for 1 year and candidates will be interviewed on 18th January for duty as from 1st February, 1952.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, should reach the undersigned by 9th January, 1952.

C. R. JOLLY, Secretary,
Paddington Group Hospital Management Committee.
285, Harrow-road, W.9.

PRINCE OF WALES'S GENERAL HOSPITAL. Tottenham GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN to the Pædiatric Department (third post), to become vacant at the end of January, 1952, for a period of 6 months. The post is recognised for the D.C.H. examination. Salary in accordance with terms of service issued by the Ministry of Health.

Application forms to be obtained from the Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned not later than 5th January, 1952.

PRINCE OF WALES'S GENERAL HOSPITAL. (218 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4). Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE PHYSICIAN (third post) for a period of 6 months commencing on 21st February, 1952.

Application form from the Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned to the Secretary by 12th January, 1952.

PRINCE OF WALES'S GENERAL HOSPITAL. (218 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4). Applications are invited from registered medical practitioners for the appointment of RESIDENT JUNIOR HOUSE PHYSICIAN (first or second post) for a period of 6 months.

Application form from the Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned to the Secretary by 12th January, 1952.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN, Dovehouse-street, S.W.3. Applications are invited for the resident appointment of HOUSE SURGEON (Female), Senior House Officer, tenable for 8 months from 1st April, 1952.

Applications must be lodged with the undersigned by 12th January, 1952, on forms obtainable from R. S. H. THOMAS, Secretary to the Board of Governors, 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN, Dovehouse-street, S.W.3. Applications are invited for the resident appointment of HOUSE SURGEON (Senior House Officer), tenable for 1 year from 1st April, 1952. Candidates must be ineligible for H.M. Forces.

Applications must be lodged with the undersigned by 12th January, 1952, on forms obtainable from R. S. H. THOMAS, Secretary to the Board of Governors, 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Goldhawk-road, W.6. Applications are invited for the resident appointments of JUNIOR OBSTETRIC OFFICER (Senior House Officer) and JUNIOR DISTRICT OBSTETRIC OFFICER (Senior House Officer), tenable for 6 months from 1st April, 1952. Candidates must be ineligible for H.M. Forces and for the District post must be in possession of a current driving licence. The holders of these posts proceed to the senior posts after 3 months.

Applications must be lodged with the undersigned by 12th January, 1952, on forms obtainable from R. S. H. THOMAS, Secretary to the Board of Governors, 339, Goldhawk-road, London, W.6.

ROYAL FREE HOSPITAL GROUP. Applications are invited from either Men or Women medical practitioners for the appointment of SENIOR ANÆSTHETIC REGISTRAR (resident). Applicants must not be more than 10 years qualified and should possess the D.A. qualification. The appointment is for 1 year in the first instance, duties to commence on 1st April, 1952. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 31st January, 1952

ROYAL FREE HOSPITAL GROUP. Applications are invited from medical practitioners of not more than 10 years qualification, for the post of RESIDENT MEDICAL OFFICER at the North Western branch of the above Group. Duties to commence on 1st February, 1952, for a period of 1 year. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Junior Hospital Medical Officers.

Application forms may be obtained from the Secretary, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 7th January, 1952.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, vacant 1st January, 1952. The appointment will be for a period of 6 months. Salary on National Health Service scale £350–£450 p.a., less emoluments. Candidates will be required to attend a meeting of the Medical Committee for interview.

Applications, stating age, qualifications, and experience, to be addressed to the Secretary.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as a Whole-time REGISTRAR in General Medicine to the Lewisham group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience, with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 18th January, 1952.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. NORTHERN GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of ORTHOPÆDIC HOUSE SURGEON. Post involves occasional casualty duties. Salary £400–£450 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications with dates, and nationality, together with copies of 3 recent testimonials, to be sent immediately to the Assistant Secretary.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. NORTHERN GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN, for a period of 6 months from 5th February, 1952. Salary £400–£450 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications with dates, and nationality, together with copies of 3 recent testimonials, to be sent to the Assistant Secretary not later than 12th January, 1952.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON, vacant on 4th January. Post tenable for 6 months.

Applications, stating age, and qualifications, should be sent immediately to the Medical Superintendent, St. Andrew's Hospital, Bow, E.3.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON to the Obstetric and Gynæcological Department from 18th January. Post tenable for 6 months.

Applications, stating age, and qualifications, should be sent immediately to the Medical Superintendent, St. Andrew's Hospital, Bow, E.3.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of REGISTRAR to the Department of Anæsthetics. This is a full-time appointment, non-resident except for certain emergency duties. The post falls vacant on 1st March, 1951.

Applications, together with the names of 2 referees, must be received by the undersigned not later than 21st January, 1952.

P. H. CONSTABLE, House Governor.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE SURGEON (House Officer, first, second, or third). Tenable for 6 months. Salary, &c., in accordance with national scale.

Application forms should be obtained from, and returned immediately to, the Medical Superintendent.

ST. PETER'S AND ST. PAUL'S HOSPITALS. Required, RESIDENT SURGICAL OFFICER for a new Hospital which is to be designated as a constituent Hospital in the above teaching group for the treatment of male and female chronic urological cases, including children. Salary scale as for Senior House Officer. Appointment for 6 months to date from 1st March, 1952.

Applications (6 copies), with 6 copies of 2 recent testimonials, to the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2, by 19th January, 1952.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required to take charge of 32 surgical beds which are under the direction of the Surgical Consultant of Lambeth Hospital, Kennington; and also to work under the E.N.T. Consultant at the South Western Hospital.

For form of application apply to the Physician-Superintendent at the Hospital.

WESTMINSTER CHILDREN'S HOSPITAL. Westminster HOSPITAL TEACHING GROUP. Applications are invited for the following appointments for 6 months from 1st March, 1952:—

HOUSE PHYSICIAN.
HOUSE SURGEON.

Salary £400 or £450 p.a. in each case, with deductions of £100 p.a. for residence.

Applications, with copies of testimonials, should be submitted by 7th January, 1952, to the Assistant Secretary, Westminster Children's Hospital, Vincent-square, S.W.1.

WHITTINGTON HOSPITAL, Highgate-hill, N.19. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR required for 1 year in the first instance. The unit contains 85 maternity and 56 gynæcological beds and is recognised for the M.R.C.O.G. Candidates are welcome to visit the Hospital by direct appointment with the Medical Superintendent.

Application forms obtainable from, and returnable to, the Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, by 14th January, 1951.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. RESIDENT HOUSE SURGEON. Salary £350–£450 p.a., less £100 p.a. for residence. Appointment for 6 months from 1st February, 1952, plus locum duty from 18th January (14 days).

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 2 testimonials, to Assistant Secretary by 9th January, 1952.

Provincial

ABERDEEN ROYAL INFIRMARY. Board of Manage-MENT FOR THE ABERDEEN GENERAL HOSPITALS. Applications are invited for the appointment of REGISTRAR in Ophthalmology at the above Hospital. The post is a whole-time one and is non-resident. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications, and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ACCRINGTON. VICTORIA HOSPITAL. (112 Acute Beds.) HOUSE SURGEON required, post tenable for 6 months. Salary £350–£450 p.a. according to previous posts held, less £100 for board-residence.

Applications, giving age, nationality, qualifications, &c., accompanied by copies of 2 testimonials, to be addressed to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

ASHFORD HOSPITAL, Ashford, Kent. (125 Beds.) SOUTH EAST KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from medical practitioners for the post of RESIDENT HOUSE SURGEON at the above Hospital. The appointment will be for a period of 6 months. Excellent experience to be obtained of emergency and general surgery with rapid turnover. 2 General Consultant Surgeons and a Consultant Orthopædic Surgeon hold sessions at this modern hospital. Some casualty work shared with other House Officers. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Kent. South East KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from medical practitioners for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital. The appointment will be for a period of 6 months. Excellent facilities for gaining experience in clinical medicine are provided by 50 medical beds under supervision of a Consultant Physician who visits Hospital on 4 occasions weekly. There are full diagnostic facilities and a rapidly developing Outpatient Department. In affiliation with a nearby hospital in the group a fully equipped Cardiac Centre is provided. Some casualty work shared with other House Officers. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE PHYSICIAN (Male) for Wards taking cases of Pulmonary Tuberculosis (56 Beds) under supervision of the visiting Consultant Physician, post vacant early January. Opportunity to acquire knowledge of the modern treatment of acute tuberculosis. 6 months appointment. National Health Service salary and conditions of service.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital by 12th January, 1952.

ASHFORD HOSPITAL, Ashford, Middlesex. (Tuberculosis Unit—56 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required to work half-time at the Tuberculosis Unit, Ashford Hospital and half-time at the Chest Clinic, 28, Bell-road, Hounslow. Whole-time, non-resident, appointment for 1 year in first instance. Candidates are welcome to visit the Hospital and the Clinic by direct appointment with the Medical Director or the Chest Physician respectively.

Application forms obtainable from, and returnable to, Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 8th January, 1952.

ASHTON, HYDE, AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the following House Officer appointments tenable for a period of 6 months :—

District Infirmary, Ashton-under-Lyne (200 Beds)

HOUSE SURGEON (general surgery), vacant now.

CASUALTY OFFICER (Senior House Officer grade), vacant now.

CASUALTY AND ORTHOPÆDIC HOUSE SURGEON, vacant now.

These posts are recognised for the F.R.C.S. (Eng.).

Lake Hospital, Ashton-under-Lyne (600 Beds)

HOUSE PHYSICIAN, vacant late January.

Appointments are subject to Ministry of Health terms and conditions of service.

Applications, giving age, nationality, qualifications, and experience, with copies of 3 testimonials, should be forwarded to R. W. MCVITY, Secretary.

Astley-road, Stalybridge, Cheshire.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. HOUSE SURGEON (first or second post) to the Department of Children's Surgery and Orthopædics, which is centred on this Hospital for the area, vacant now. There are 35 orthopædic beds and 10 children's beds.

Please apply, with 2 testimonials, to Secretary-Superintendent, as soon as possible.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. SENIOR HOUSE OFFICER (Accident and Orthopædic Service), vacant now. Duties include main charge of the Casualty Department under a Visiting Consultant, together with those of Senior Resident. The Accident and Orthopædic Department of the area is centred on this Hospital. Salary £670 p.a., less a deduction of £140 for residence, &c.

Applications, with 2 testimonials, to the Secretary-Superintendent as soon as possible.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. HOUSE SURGEON (first or second post), for E.N.T. and Ophthalmic Department, vacant now. Recognised for D.L.O. and D.O.

Please apply, with 2 testimonials, to Secretary-Superintendent, as soon as possible.

AYLESBURY. TINDAL GENERAL HOSPITAL. (281 Beds.) RESIDENT SURGICAL OFFICER (Senior House Officer), vacant 20th February, 1952. The Surgical Unit consists of 95 Beds and undertakes all adult general surgery for the area, including emergencies. The post offers excellent training in practical surgery and is eminently suitable for a F.R.C.S. final candidate. Salary £670 p.a., less £140 emoluments.

Please apply, with 2 testimonials, to the Administrative Officer by 7th January, 1952. Further details on request.

BANBURY. HORTON GENERAL HOSPITAL. (170 Beds.) CASUALTY OFFICER AND ORTHOPÆDIC HOUSE SURGEON (Male or Female) required 1st January. Post tenable 6 months in first instance. Salary from £350, according to experience.

Applications, stating age, nationality, qualifications, and names of 2 referees, to the Secretary, Hospital Management Committee, Horton General Hospital, Banbury, Oxon.

BANBURY. HORTON GENERAL HOSPITAL. (170 Beds.) HOUSE SURGEON (Male or Female) required 1st January for general surgical and gynæcological beds. 4 other residents. Post tenable 6 months in first instance. Salary from £350, according to experience. Recognised for 6 months training F.R.C.S.(Eng.).

Applications, stating age, nationality, qualifications, and names of 2 referees, to the Secretary, Hospital Management Committee, Horton General Hospital, Banbury, Oxon.

BARNET GENERAL HOSPITAL, Barnet, Herts. Applications are invited for the post of SENIOR MEDICAL REGISTRAR to an Acute Unit of 50 Beds. The post which is immediately available is temporary pending the approval of a permanent appointment by the Regional Board. Candidates should possess a higher qualification.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to the Medical Director, Barnet Group Hospital Management Committee.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) 2 HOUSE SURGEONS, posts now vacant.

Applications to Secretary and Finance Officer, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple, Devon.

BEDFORD GENERAL HOSPITAL. (426 Beds.) Applications are invited for the posts of HOUSE PHYSICIANS at the above Hospital, which consists of 2 wings. The post at the South Wing is vacant on 1st February, 1952, and at the North Wing on 11th February, 1952.

Applications, stating age, nationality, qualifications, previous appointments, together with the names of 2 referees, should be sent to the Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL (South Wing). House SURGEON. This appointment is recognised for F.R.C.S. and offers exceptional opportunities for general experience in a busy acute surgical unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be addressed to the Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM ACCIDENT HOSPITAL AND RE-HABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (209 Beds.) GROUP 25 BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the posts of HOUSE SURGEON, 1 of which falls vacant on 1st February, 1952, and 2 further posts which fall vacant on 1st March, 1952. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest traumatic unit in the country, and treats 50,000 new patients each year. The posts offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff ; are recognised for the F.R.C.S.

Applications, accompanied by copies of recent testimonials or names of 2 referees, to be sent to the Administrator.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (900 Beds.) THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. 3 HOUSE SURGEONS (resident). Applications are invited for the above appointments which will become vacant in December and January. These appointments are approved as resident posts required for the final F.R.C.S. (Eng.).

Applications, stating age, qualifications, nationality, and experience, accompanied by copies of 3 recent testimonials, to the Secretary, Hospital Management Committee, Dudley Road Hospital.

BIRMINGHAM, 18. WINSON GREEN HOSPITAL. BIRMINGHAM (MENTAL A) GROUP NO. 5 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female). Salary at the rate of £670 p.a., less a charge of £120 p.a. for board and lodging if resident. The post, which will be for 1 year in the first instance, will be subject to the terms and conditions of service for medical and dental staffs and subject to the National Health Service superannuation regulations. The hospital is associated with the University of Birmingham for the teaching of Psychiatry and training for the Diploma in Psychological Medicine will be provided.

Applications, stating age, and qualifications, to be sent to the Medical Superintendent at the Hospital.

BIRMINGHAM. HIGHCROFT HALL MENTAL HOS-PITAL, ERDINGTON, BIRMINGHAM, 23. (1200 Beds.) Vacancies exist for :—

JUNIOR HOSPITAL MEDICAL OFFICERS (resident). Self-contained flat for married officer or single quarters provided.

SENIOR HOUSE OFFICERS (Male or Female). Separate residential quarters provided for which a deduction of £150 p.a. is made in respect of emoluments.

Applications to be sent to Medical Superintendent.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for following whole-time appointments :—

(*a*) REGISTRAR in Psychiatry, Birmingham (Mental C) Group ; duties at Highcroft Hall, Erdington (1179 Beds). Accommodation available.

(*b*) SURGICAL REGISTRAR, Mid-Worcestershire group ; duties at Kidderminster General Hospital. Resident appointment. Candidates should have experience in general surgery. Possession of F.R.C.S. an advantage.

(*c*) OPHTHALMIC REGISTRAR, Wolverhampton group ; duties at Wolverhampton Eye Infirmary (100 Beds). Non-resident appointment, Experience in specialty essential. Higher qualification an advantage.

Appointments subject to National Health Service superannuation regulations.

Applications (10 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 7th January, 1952. Candidates may visit the Hospital concerned.

BILLERICAY. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (resident) for the General Surgery and Orthopædic Departments, post vacant immediately. These departments of this Hospital provide interesting and active traumatic experience. Salary scale £350–£450 p.a., according to experience, less £100 residential emoluments. 6 months appointment in the first instance.

Applications, together with copies of not more than 3 testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

BILLERICAY. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (resident) at St. Andrew's Hospital, Billericay, for the Casualty, Orthopædic, and General Surgery Departments. The appointment will be for 6 months in the first instance and the post is vacant immediately.

Applications, together with copies of not more than 3 testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

BILLERICAY. ST. ANDREW'S HOSPITAL. (34 Beds —New Unit.) Applications are invited for the appointment of OBSTETRIC HOUSE SURGEON (resident) from registered medical practitioners (Male or Female), post vacant immediately. 6 months appointment in the first instance.

Applications, stating age, qualifications, and experience, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

G. E. WHYTE, Secretary,
South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

BATLEY. THE GENERAL HOSPITAL, Carlinghow-hill, BATLEY. (102 Beds.) DEWSBURY, BATLEY AND MIRFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER. This Hospital is a general hospital at present, but will shortly specialise in orthopædic and general surgery, ophthalmology, and otorhinolaryngology.

Applications, giving full details of age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, 20, Oxford-road, Dewsbury.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of RESIDENT HOUSE SURGEON at the above Hospital (189 Beds), with surgical work under control of Consultant Surgeons. This post is recognised for the F.R.C.S. examinations. National conditions and salary scale (House Officer grade).

Applications, stating age, qualifications, and experience, with copy testimonials, or names of referees, should be forwarded to the Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BLACKBURN ROYAL INFIRMARY. (244 Beds.) Senior HOUSE OFFICER required for Orthopædic and Fracture Departments, which include the Casualty Department. Salary £670 p.a., less the appropriate deduction in respect of board-residence if resident, but appointment may be non-resident if desired. The post is recognised for the F.R.C.S. examination.

Applications, stating age, experience and qualifications, and accompanied by copies of 2 recent testimonials or names for reference, to be addressed to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKBURN ROYAL INFIRMARY. (244 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON to the General Surgical Unit. The appointment will be for a period of 6 months in the first instance, and the salary, &c., will be in accordance with the terms and conditions of service of hospital medical and dental staffs.

Applications, giving age, nationality, qualifications, &c., with copies of 2 testimonials to be sent to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn, as soon as possible.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics.) The post is recognised for the D.A. examination and is tenable for 1 year. Salary £670 p.a., less an appropriate deduction in respect of board-residence.

Applications, stating age, qualifications, nationality, and experience, &c., with names of 2 persons for reference, should be addressed to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKBURN. QUEEN'S PARK HOSPITAL. (651 Beds.) HOUSE PHYSICIAN required, post tenable for 6 months. Salary £350–£450 p.a., according to previous posts held, less £100 for board-residence.

Applications giving age, nationality, qualifications, &c., accompanied by copies of 2 testimonials, to be addressed to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BOWDON, CHESHIRE. MANCHESTER THROAT AND CHEST HOSPITAL. (53 Beds.) NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR E.N.T. HOUSE OFFICER, to commence on or about 15th February, 1952. 12 months appointment. This appointment is in a busy hospital staffed by Manchester Consultants and offers excellent opportunities of practical experience to suitably qualified candidates. Salary £670 p.a. Conditions as laid down in accordance with the terms of service issued by the Ministry of Health.

Applications, stating age, qualifications, &c., should be forwarded to the Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ORTHOPÆDIC SENIOR HOUSE OFFICER (resident), required immediately. The post is recognised for the F.R.C.S. examination, and applicants must have been registered for at least 12 months. The post is tenable for 12 months.

Applications to the Assistant Secretary at the Hospital.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. HOUSE OFFICER (first, second, or third post). Tenable for 6 months. Duties to include work in general surgical and gynæcological wards. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a. Recognised under F.R.C.S. regulations.

Applications, with copies of 3 recent testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (300 occupied Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER (surgical). Salary £670 p.a., less £130 p.a. in respect of residential emoluments. The appointment is due to commence in January, 1952, for a period of 1 year.

Applications, stating nationality, age, qualifications, and experience, with copies of recent testimonials, or the names of referees, should be sent to the Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (300 occupied Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of Whole-time REGISTRAR (anæsthetics) at the above Hospital. Salary at the rate of £775–£890 p.a., less £130 p.a. for residential emoluments. Appointment to commence 1st January, 1952, for a period up to 1 year.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Administrative Officer.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (300 occupied Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (surgical), first or second post held. Salary £350–£400 p.a., less £100 p.a. for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent as soon as possible to the Administrative Officer.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), resident. Applications are invited for the above appointment. The salary and conditions of service are those laid down by the Ministry of Health. The post is recognised for the Diploma in Anæsthetics and the person appointed will be trained under the personal supervision of the Consultant Anæsthetist.

Applications, together with the names and addresses of 3 referees, should be addressed to the Secretary, Burnley and District Hospital Management Committee, General Hospital, Casterton-avenue, Burnley.

BURNLEY GENERAL HOSPITAL. (656 Beds.) Burnley AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (surgical). The post is now vacant and tenable for 6 months. Salary and conditions of service in accordance with the National Health Service terms. The post is recognised for the F.R.C.S. examination.

Applications, together with copies of 3 testimonials, should be sent forthwith to—

J. E. WHEATCROFT, Secretary to the Committee.
General Hospital, Casterton-avenue, Burnley.

BURTON-ON-TRENT. THE GENERAL INFIRMARY. (Acute General Hospital—235 Beds.) BURTON-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (resident), now vacant, a newly approved addition to the surgical establishment. This appointment is recognised for examination purposes by the Royal College of Surgeons, offering excellent general experience in a busy acute Surgical Unit.

Applications, with all details and copies of recent testimonials, to— J. E. SMITH,
Secretary to the Hospital Management Committee.

BRIDGEND GENERAL HOSPITAL, Quarella-road, BRIDGEND. (364 Beds.) MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following appointments at this Hospital which has a panel of distinguished full-time and visiting Consultants :—

HOUSE PHYSICIAN (pædiatrics).
HOUSE PHYSICIAN (obstetrics and gynæcology).
HOUSE PHYSICIAN (general medicine).

Salary at the rate of £350–£450 p.a., according to experience, with a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and giving the names of 2 referees, should be addressed to the Secretary of the Committee, 8, Wind-street, Neath, immediately.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. 2 HOUSE SURGEONS required for duties in the E.N.T. Department of the above Group Hospitals (78 Beds), vacant now. Recognised for F.R.C.S. and D.L.O.

Applications, with full details of experience, &c., giving the names and addresses of 2 referees, should be sent to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, within 7 days of the appearance of this advertisement.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) Applications are invited for the following posts at the above Hospital.

CASUALTY HOUSE SURGEON (including care of fracture cases).
ORTHOPÆDIC HOUSE SURGEON.

Both posts vacant now.

Applications, with full details of age, experience, &c., together with the names and addresses of 2 referees, to be sent to the Administrative Officer of the Hospital within 7 days of the appearance of this advertisement.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (448 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Regional Neurosurgery Department. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (448 staffed beds, expanding.) HOUSE SURGEON, Thoracic Surgery Department. Vacancies occur shortly in the above department which is the Regional Thoracic Surgery Centre (108 Beds) for the South West.

Applications, with full particulars, should be addressed to the Secretary, Frenchay Hospital, quoting "Thoracic."

BRISTOL. UNITED BRISTOL HOSPITALS. (Joint appointment with the SOUTH WESTERN REGIONAL HOSPITAL BOARD.) Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR or REGISTRAR in Radiology (diagnostic). The appointment will be subject to the terms and conditions of service of hospital medical and dental staffs negotiated between the Minister and the profession. The successful applicant will be appointed to work in the first instance for 1 year in the United Bristol Hospitals, the Teaching Hospital for Bristol University.

Applications, stating age, qualifications, experience, and giving the names of 2 referees, should be sent not later than 14th January, 1952, to Secretary to the Board, Royal Infirmary Branch, Bristol, 2.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital (with continuation hospital 183 Beds—Acute General Hospital, mainly Surgical, with beds for Orthopædic, Medical, and other specialties)

SENIOR HOUSE OFFICER (orthopædic).
HOUSE SURGEON.
SENIOR HOUSE OFFICER (anæsthetics).

These posts are recognised for F.R.C.S. or D.A. examinations.

Florence Nightingale Hospital and Aitken Sanatorium (I.D. 96 Beds ; T.B. 94 Beds)

HOUSE PHYSICIAN.

Applications are invited for the above posts and should indicate age, nationality, qualifications, and experience, and should be sent to the undersigned as soon as possible.

H. WILKINSON, Secretary to the Committee.

Bury General Hospital, Bury, Lancs.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON (first post). Salary at the rate of £350 p.a., less £100 residential emoluments.

Applications, stating age, qualifications, experience, and enclosing copy testimonials, should be forwarded to the Secretary, Group Management Committee, General Hospital, Cheltenham.

CHELMSFORD AND ESSEX HOSPITAL, London-road, CHELMSFORD. (163 Beds.) SENIOR HOUSE OFFICER (casualty) required at above Hospital, to commence duties on 1st January, 1952.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Chelmsford Group Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL, London-road, CHELMSFORD. (163 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (first, second, or third post) to work in the General Medical Wards of the above Hospital. Duties will commence immediately.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Chelmsford Group Hospital Management Committee, London-road, Chelmsford.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. Applications are invited for the post of HOUSE SURGEON (first or subsequent post) to the Orthopædic and Fracture Department at Addenbrooke's Hospital, vacant on 28th February, 1952. Salary, terms, and conditions as approved for hospital medical staff.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent to the undersigned not later than Saturday, 12th January, 1952. J. A. BEARDSALL, Secretary.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (257 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

(*a*) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON, which is now vacant, and which is recognised for the F.R.C.S. Diploma.

(*b*) HOUSE PHYSICIAN. This post becomes vacant in the middle of January.

National Health Service salary and conditions.

Applications to be addressed to the Chief Administrative Officer at the Hospital.

CARMARTHEN. ST. DAVID'S HOSPITAL. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Opportunities are afforded for acquiring experience in all branches of psychiatry. The Hospital has modern, well-equipped departments, and is responsible for 5 Outpatient Clinics. Facilities for training for the D.P.M. available. Salary £700–£50–£1000 p.a., with a charge of £150 for full board-residence.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, to be sent to the Medical Superintendent as soon as possible.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (134 Beds—Visiting Specialist Staff.) Applications invited from registered medical practitioners for appointment of RESIDENT SURGICAL OFFICER (Senior House Officer grade). 3 other resident medical staff. Salary in accordance with national scale. Full residential emoluments.

Applications are to be sent to—

NORMAN BALL, Secretary,
West Wales Hospital Management Committee.
Glangwili, Carmarthen.

CHORLEY AND DISTRICT HOSPITAL, Lancs. House SURGEON (Junior House Officer grade) required. 6 months post. Ministry of Health scale and conditions.

Applications to be forwarded to the undersigned at the Royal Infirmary, Preston. JOHN GIBSON, Secretary.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) Required, RESIDENT HOUSE SURGEON for the Gynæcological and Special (E.N.T., Eye, &c.) Departments. Salary in accordance with terms and conditions of National Health Service. Hospital within easy reach of London.

Applications, together with testimonials or names of referees, should be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

COLCHESTER. ESSEX COUNTY HOSPITAL. (21 Gynæcological Beds.) COLCHESTER MATERNITY HOSPITAL. (22 Obstetric Beds.) HOUSE OFFICER (Male or Female), obstetric and gynæcological, first, second, or third post. Appointment tenable for 6 months. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 recent testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester.

COTTINGHAM, EAST YORKS. CASTLE HILL HOS-PITAL. (200 Beds—modern Infectious Diseases Hospital with full laboratory facilities.) Whole-time HOUSE OFFICER required (second or third post) for duties under the supervision of the Consultant in Infectious Diseases.

Application forms obtainable from the Secretary, Hull B Group Hospital Management Committee, De la Pole Hospital, Willerby, East Yorks.

CREWE MEMORIAL HOSPITAL, Crewe, Cheshire. (General Hospital 108 Beds—and Continuation Annexe 33 Beds.)

SENIOR HOUSE OFFICER. Salary £670 p.a. Duties to commence early January, 1952.
HOUSE OFFICER (surgical). Salary scale £350–£450 p.a. Duties to commence as early as possible.

Applications are invited for the above posts, subject to the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, giving particulars of age, experience, &c., together with copies of 3 testimonials, to be sent to the Secretary, South Cheshire Hospital Management Committee, 540, West-street, Crewe.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners with experience for the post of CASUALTY OFFICER (Senior House Officer). Salary £670 p.a., deduction of £150 p.a. for full residential emoluments. The post is tenable for 12 months and is renewable annually.

Apply, with references, stating age and experience, to—

G. W. BECKWITH, Secretary.

DOUGLAS, ISLE OF MAN. NOBLE'S ISLE OF MAN HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST in busy hospital with over 150 Beds and the usual ancillary departments. Post will provide ample and varied experience in pleasant surroundings. Salary £400 p.a., less £100 p.a. for board and lodging. Duties may include acting in the medical wards or casualty. Appointment for 6 months in first instance.

Applications, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas.

DERBY CITY HOSPITAL. Derby Area No. 1 Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for appointment of HOUSE SURGEON.

Apply to Medical Superintendent, City Hospital, Derby, as soon as possible.

DERBYSHIRE ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Applications are invited for the non-resident whole-time post of ORTHOPÆDIC REGISTRAR to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 7th January, 1952.

DERBYSHIRE ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Applications are invited for the non-resident whole-time post of ANÆSTHETIC REGISTRAR to the above Hospital, which is a recognised training hospital for the D.A. The appointment is for 1 year in the first instance, and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 7th January, 1952.

DONCASTER. WESTERN HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited for the resident whole-time post of REGISTRAR (obstetrics and gynæcology) to the above Hospital, which is recognised as a training hospital for the D.Obst. R.C.O.G. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 7th January, 1952.

DOVER. ROYAL VICTORIA HOSPITAL. South East KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of JUNIOR HOUSE SURGEON at the above Hospital. The Hospital is recognised by the Royal College of Surgeons. The salary will be £350, £400, and £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

DOVER. BUCKLAND HOSPITAL. South East Kent HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from medical practitioners for the post of RESIDENT HOUSE SURGEON (obstetric and gynæcological) at the above Hospital. The appointment is recognised for the D.Obst.R.C.O.G. and will be tenable for a period of 6 months. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

DOVER. BUCKLAND HOSPITAL. South East Kent HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of HOUSE PHYSICIAN at the above Hospital. The salary will be £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made for residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEONS (first post and second or third posts), vacant now, for duties with general surgical unit which includes some orthopædics. Posts are recognised by the Royal College of Surgeons. 6 months appointments.

Applications, stating age, qualifications, experience, and nationality, with the names of 2 referees, to the Acting Medical Director of the Hospital immediately.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER in Anæsthetics (second or third post), vacant 1st March, 1952. Post recognised for the D.A. 6 months appointment. R practitioners holding first posts may apply.

Applications, stating age, nationality, qualifications, and experience, with the names of 2 referees, to the Acting Medical Director of the Hospital by 21st January, 1952.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. South EAST KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital. Salary will be £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone, Kent.

EPPING. ST. MARGARET'S HOSPITAL. (500 Beds.) HOUSE SURGEON required at the above Hospital.

Applications, with copies of 2 recent testimonials, to be forwarded immediately to the Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping.

EPSOM DISTRICT HOSPITAL, Epsom, Surrey. (300 Beds.) SENIOR HOUSE OFFICER (casualty). Applications are invited for this appointment, normally held for 1 year. The Hospital has a busy Casualty and Outpatient Department with excellent experience in minor and traumatic surgery. 6 House Officers in residence. Candidates should have held previous House Officer posts and are invited to visit the Hospital.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 recent testimonials, to be sent as soon as possible to the Secretary at the above address.

FALMOUTH. DISTRICT HOSPITAL. (62 Beds— 2 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON, vacant 8th February, 1952, in an extremely active general hospital doing major surgery and with both Outpatient and Casualty Departments. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Falmouth and District Hospital, Falmouth.

FALMOUTH. DISTRICT HOSPITAL. (62 Beds— 2 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN, vacant 26th February, 1952. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Falmouth and District Hospital, Falmouth.

GLAMORGAN. MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following appointments at hospitals in the Group :—

Neath General Hospital (412 Beds)
HOUSE PHYSICIAN (general medicine).
HOUSE SURGEON (obstetrics and gynæcology).
HOUSE SURGEON.

Bridgend General Hospital (364 Beds)
HOUSE SURGEON.

Tonna Children's Hospital (90 Beds)
HOUSE SURGEON.

Port Talbot General Hospital (85 Beds)
HOUSE PHYSICIAN

Salary at the rate of £350–£450 p.a., according to experience, plus an additional payment of £50 p.a. authorised by the Ministry of Health in respect of these posts. A deduction of £100 will be made for residential emoluments.

Applications, stating age, qualifications, experience, and giving the names of 2 referees, should be addressed to the Secretary of the Committe, 8, Wind-street, Neath, immediately.

GLASGOW, S.W.1. SOUTHERN GENERAL HOS-PITAL. Applications are invited for the following resident posts which will become vacant on 1st February, 1952 :—

Locum JUNIOR HOUSE OFFICER and JUNIOR HOUSE OFFICERS for the following Departments : Dermatology, E.N.T., Gynæcology, and Psychiatry.

Applications should be sent to the Medical Superintendent immediately.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgical), now vacant.

Apply to Administrative Officer, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Locum HOUSE OFFICER (surgical) required immediately for a few weeks.

Apply immediately to Administrative Officer, Grimsby General Hospital.

GRIMSBY. SCARTHO ROAD INFIRMARY. Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of Locum RESIDENT HOUSE OFFICER (surgical). The Officer appointed will have charge of acute and other surgical beds, under the visiting Consultants' care, attend operating sessions and outpatients' sessions weekly, and share in routine ward duties.

Applications to the Administrative Officer.

GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications invited for the appointment of HOUSE OFFICER (Male or Female) for General Surgery, E.N.T., and Ophthalmic Departments at Grimsby General Hospital. Post vacant immediately.

Apply to the Administrative Officer, Grimsby General Hospital, Grimsby.

GATESHEAD. QUEEN ELIZABETH AND BENSHAM GENERAL HOSPITALS. GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON to the Gynæcological Unit at the above Hospitals. This post is now vacant.

Applications should be addressed to the Medical Superintendent, Queen Elizabeth Hospital, Sheriff-hill, Gateshead, 9, co. Durham, together with copies of 2 recent testimonials, as soon as possible.

GATESHEAD. QUEEN ELIZABETH AND BENSHAM GENERAL HOSPITALS. GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointments of 2 HOUSE PHYSICIANS at the above Hospitals. The appointments become vacant on 1st February, 1952.

Applications, together with copies of 2 recent testimonials, should be made to the Medical Superintendent, Queen Elizabeth Hospital, Sheriff-hill, Gateshead, 9, as soon as possible.

GATESHEAD. QUEEN ELIZABETH AND BENSHAM GENERAL HOSPITALS. GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointments of 3 HOUSE SURGEONS at the above Hospitals. 2 of these appointments become vacant on 1st February, 1952, and 1 post is vacant now.

Applications, together with copies of 2 recent testimonials, should be made to the Medical Superintendent, Queen Elizabeth Hospital, Sheriff-hill, Gateshead, 9, co. Durham, as soon as possible.

GATESHEAD. QUEEN ELIZABETH AND BENSHAM GENERAL HOSPITALS. GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointments of 2 RESIDENT OBSTETRIC OFFICERS at the above Hospitals. These appointments become vacant on 1st February, 1952.

Applications, together with copies of 2 recent testimonials, should be addressed to the Medical Superintendent, Queen Elizabeth Hospital, Sheriff-hill, Gateshead, 9, co. Durham, as soon as possible.

GATESHEAD. QUEEN ELIZABETH AND BENSHAM GENERAL HOSPITALS. GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST at the above Hospitals. This appointment becomes vacant on 1st February, 1952. The post is recognised for the purposes of D.A.

Applications, together with copies of 2 recent testimonials, should be addressed to the Medical Superintendent, Queen Elizabeth Hospital, Sheriff-hill, Gateshead, 9, co. Durham, as soon as possible.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds—recognised for D.Obst.R.C.O.G.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON for the Gynæcological and Obstetrical Departments, immediate vacancy. Salary, according to experience, on the National Health Service scale.

Applications as soon as possible to the Assistant Secretary.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, vacant mid-January. Salary, according to experience, on the National Health Service scale.

Applications as soon as possible to the Assistant Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required at above Hospital, post vacant 15th January, 1952. National scale of salary.

Applications to be sent to the Administrator at the Hospital.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALTY HOUSE OFFICER required at above Hospital, post vacant 17th January, 1952. National scale of salary.

Applications to be sent to the Administrator at the Hospital.

HEREFORD. GENERAL HOSPITAL. (154 Beds.) HEREFORDSHIRE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for appointment of HOUSE SURGEON (Casualty, E.N.T., and Fracture Departments). R practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, with copies of 2 recent testimonials, should be sent to the Secretary, Hospital Management Committee, County Hospital, Hereford.

HEREFORD. GENERAL HOSPITAL. (154 Beds.) HEREFORDSHIRE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for appointment of HOUSE OFFICER (medicine), vacant as from 24th January, 1952. Conditions of service applicable to hospital medical and dental staffs (England and Wales).

Applications, with copies of 2 recent testimonials, should be sent to the Secretary, Hospital Management Committee, County Hospital, Hereford.

HEREFORD. COUNTY HOSPITAL. (333 Beds.) Hereford-SHIRE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for appointment of HOUSE OFFICER (general surgery), vacant as from 17th January, 1952. Conditions of service applicable to hospital medical and dental staffs (England and Wales).

Applications, with copies of 2 recent testimonials, should be sent to the Medical Superintendent, County Hospital, Hereford.

HULL A GROUP HOSPITAL MANAGEMENT COM-MITTEE. SENIOR HOUSE OFFICER in Anæsthetics required for duties at various hospitals in the Group. Resident or non-resident. Salary £670 p.a.; if resident, less £130 for residential emoluments. Appointment will be for 12 months in the first instance, but will be terminable at any time by 2 months notice on either side.

Application forms may be obtained from, and should be returned as soon as possible to, R. J. CARLESS, Secretary to the Management Committee, Hull Royal Infirmary.

HULL. KINGSTON GENERAL HOSPITAL. (398 Beds— 5 Residents.) 2 HOUSE PHYSICIANS required immediately for General Medicine at the above Hospital.

Applications, with full particulars, to be forwarded to the Administrative Officer, Hull A Group Hospital Management Committee.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. Applications are invited for the following posts, vacant now :—

HOUSE SURGEON (recognised for F.R.C.S.).
ORTHOPÆDIC HOUSE SURGEON.
E.N.T. HOUSE SURGEON (recognised for D.L.O.).
CASUALTY OFFICER.

Appointments tenable for 6 months. Salaries in accordance with national scale—i.e., £350–£450 p.a., according to previous posts held.

Forms of application from the Administrative Officer.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street, HULL. (143 Beds.) Applications are invited for the following posts :—

HOUSE SURGEON, vacant 1st February, 1952.
HOUSE SURGEON, vacant 1st March, 1952.

Both posts are for a term of 6 months and count towards qualification for the D.C.H. Salary £350–£450 p.a., according to experience.

Applications, together with testimonials, to be sent to the Administrative Officer, Hull A Group Hospital Management Committee, at the above address.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (resident) required to commence duties immediately. Senior House Officer grade. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs—£670 a year, less £130 in respect of residential emoluments.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. HOUSE PHYSICIAN (resident), Male, required at above Hospital. Appointment recognised for M.D. (Lond.) Branch 1, tenable for 6 months.

Applications, not later than 14th January, stating age, qualifications, nationality, and experience, with copies of not more than 3 recent testimonials, to be made to the Medical Director.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (705 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time PÆDIATRIC REGISTRAR required for 1 year in first instance. Previous pædiatric experience essential. Duties include work in the Neonatal Unit and in the Pædiatric Out-patients Clinic. Unit recognised for D.C.H. Post vacant 1st January, 1952. Candidates are welcome to visit the Hospital by direct appointment with the Medical Director.

Application forms obtainable from, and returnable to, the Secretary, Uxbridge Group Hospital Management Committee, St. John's Hospital, Kingston-lane, Uxbridge, Middlesex, by 8th January.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (81 Beds—General Acute.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL REGISTRAR required for 1 year in first instance. Candidates may visit the Hospital by direct appointment with the Assistant Secretary of the Hospital.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, London-road, Ashford, Middlesex, by 8th January, 1952.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (first, second, or third post), for Surgical Unit.

Applications (endorsed "House Officer—Surgical Unit—West Middlesex Hospital"), stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to the Secretary, Management Committee, West Middlesex Hospital, Isleworth. Closing date 8th January, 1952.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) LANCASTER AND KENDAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post is vacant January, 1952, and normally tenable for 1 year. The successful applicant will work with the Specialist Unit.

Applications, stating age, qualifications, experience, and nationality, along with the names of 2 referees, should be forwarded immediately to the Secretary, Lancaster and Kendal Hospital Management Committee, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) LANCASTER AND KENDAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE OFFICER (obstetrics and gynæcology). The post will be vacant February, 1952, and is normally tenable for 6 months. The successful applicant will be attached to the Specialist Unit.

Applications, stating age, qualifications, experience, and nationality, along with the names of 2 referees, should be forwarded immediately to the Secretary, Lancaster and Kendal Hospital Management Committee, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) LANCASTER AND KENDAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN. The post will be vacant immediately, and is normally tenable for 6 months. The successful applicant will be attached to a Medical Unit.

Applications, stating age, qualifications, experience, and nationality, along with the names of 2 referees, should be forwarded immediately to the Secretary, Lancaster and Kendal Hospital Management Committee, Royal Lancaster Infirmary, Lancaster.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of a REGISTRAR in Chest Diseases for duties at the Castle Hill Sanatorium, Cottingham, E. Yorks. This is a training post in the Board's scheme for the training of chest physicians, and candidates should have had good experience in general medicine. Previous experience in tuberculosis is not essential.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of REGISTRAR in Pathology (non-resident) for duties at hospitals in the Halifax group. This post offers good facilities for training in pathology, and is normally tenable for 2 years, subject to satisfactory service.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of REGISTRAR in Orthopædic Surgery (non-resident) for duties mainly at the Bradford Royal Infirmary and also as required at other Orthopædic Units in the Bradford A group.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of REGISTRAR in Pædiatrics for duties at hospitals in the Bradford A and B Hospital Management Committee groups, resident at the Leeds Road Infectious Diseases Hospital.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of a REGISTRAR in General Medicine for duties at Hospitals in the Bradford A Hospital Management Committee group.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the appointment of a REGISTRAR in General Medicine (non-resident) for duties at hospitals in the York A group.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Psychiatry for duties at the Oulton Hall Hospital, near Wakefield, and affiliated mental deficiency colonies. The post is non-resident, and the successful candidate, if a car owner, may be allowed to reside in either Leeds or Wakefield. Facilities will be available for the successful candidate to take part in training in all aspects of psychiatry in conjunction with the Department of Psychiatry of the University of Leeds.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th January, 1952.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the post of HOUSE SURGEON (genito-urinary surgery). The person appointed will attend the Cystoscopic Clinic at the above Hospital and the Outpatient Clinic at the Teaching Hospital. The appointment is subject to the terms and conditions of service as issued by the Ministry of Health, with salary according to number of posts previously held.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

J. FOLKARD, Secretary to the Committee.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the post of E.N.T. AND OPHTHALMIC HOUSE SURGEON at the above Hospital. The appointment will be subject to the terms and conditions of service as issued by the Ministry of Health, with salary according to the number of posts previously held.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

J. FOLKARD, Secretary to the Committee.

LOUTH, LINCS. COUNTY INFIRMARY. (240 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (obstetrics, gynæcology, and some anæsthetics) which will become vacant at this busy General Hospital on 1st January, 1952. The post is resident and a deduction will be made of £100 p.a. in respect of board, residence, &c. Salary £350–£450 p.a., according to experience and as laid down in the national scale.

Applications, giving full particulars, together with names of 2 referees, to be addressed to the Administrative Officer.

LOUTH, LINCS. COUNTY INFIRMARY. (240 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgical), which will shortly become vacant at this busy General Hospital. Salary £350–£450 p.a., according to experience, and deduction of £100 p.a. will be made in respect of residential emoluments.

Applications, giving details of age, experience, nationality, together with names of 2 referees, to be addressed to the Administrative Officer at the Hospital.

LEEDS, 12. ST. MARY'S HOSPITAL. (111 Maternity Beds.) LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of DEPUTY RESIDENT OBSTETRIC OFFICER (Senior House Officer) at the above Hospital. The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £670 p.a., with an appropriate deduction in respect of board, lodgings, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 persons to whom reference may be made, to be forwarded to the undersigned, as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (non-resident), Casualty Department, immediate vacancy. The Casualty Officers cover duties in the department from 9 A.M.–7 P.M. daily. This post gives opportunity for studying for final examination for Fellowship.

Applications, with copies of 3 testimonials, to the Secretary, No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of HOUSE OFFICER for Orthopædic and Traumatic Surgery. The post is recognised by the Fellowship of the Royal College of Surgeons.

Applications, stating age, experience, and qualifications, together with copies of recent testimonials, to the Secretary, No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEIGH INFIRMARY, Leigh, Lancs. (Acute General Hospital of 102 Beds.) HOUSE SURGEON (Male or Female) required at above Hospital, Resident House Officer grade post, vacant now.

Applications, stating age, qualifications, and details of previous hospital appointments, together with the names of 2 referees, should be forwarded to the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Secretary.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL MATERNITY HOSPITAL. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE SURGEONS (obstetric) for the period of 6 months from 1st April–30th September, 1952. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street,
Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE SURGEONS (E.N.T.) for the period of 6 months from 1st April–30th September, 1952. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street,
Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ST. PAUL'S EYE HOSPITAL. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE SURGEONS (eye) for the period of 6 months from 1st April–30th September, 1952. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street,
Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE OFFICERS (all specialties) at the Liverpool Royal Infirmary, David Lewis Northern Hospital, Royal Southern Hospital, and Liverpool Stanley Hospital for the period of 6 months from 1st April–30th September, 1952. Applicants appointed to House Surgeon and Orthopædic House Surgeon posts at the Liverpool Royal Infirmary, the David Lewis Northern Hospital, and the Liverpool Stanley Hospital will be required to undertake some casualty work as part of their normal duties. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street,
Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited from registered medical practitioners for appointments as CASUALTY OFFICERS at the Royal Southern Hospital and the Royal Liverpool Children's Hospital for the period of 6 months from 1st April–30th September, 1952. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street,
Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. THE WOMEN'S HOSPITAL. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE SURGEONS (gynæcological) for the period of 6 months from 1st April–30th September, 1952. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1, 11th December, 1951.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. Applications are invited from registered medical practitioners for appointments as RESIDENT HOUSE OFFICERS (medical, surgical, orthopædic, and casualty) at the Royal Liverpool Children's Hospital (City Branch and Heswall Branch) for the period of 6 months from 1st April–30th September, 1952. The Hospital is recognised as giving the requisite experience for the D.C.H. The appointments are in accordance with the agreed terms and conditions of service (House Officers).

Applications should be made on forms which may be obtained from the undersigned to whom they should be returned by Monday, 7th January, 1952. A. V. J. HINDS, Secretary.

The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1, 11th December, 1951.

LOUGHBOROUGH GENERAL HOSPITAL. (120 Beds.) Applications are invited for the immediate vacancy of HOUSE SURGEON.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials to the Secretary, No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LYMINGTON HOSPITAL, Lymington, Hants. (107 Beds.) SENIOR HOUSE OFFICER (surgical), required at the end of December. Salary and conditions of service as laid down by the Ministry of Health.

Applications, as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON at the above Hospital. The post is recognisable for the F.R.C.S. (Eng.). Salary will be £670 a year, with a deduction at the rate of £150 for residential emoluments.

Applications should be forwarded to the Secretary of the Mid-Kent Hospital Management Committee, 103, Tonbridge-road, Maidstone.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited from registered medical practitioners (Male or Female) for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health), for a period of 6 months, commencing 9th February, 1952. Previous pædiatric experience essential. Duties include the care of the newborn in the Maternity Department, the care of infants in the Infants' Ward, and work in the Clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Application forms may be obtained from the undersigned, and should be returned, duly completed, before 12th January, 1952. A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Required, HOUSE SURGEON (first or subsequent post). Salary £350–£450 p.a., according to the number of positions previously held, less £100 p.a. for residential emoluments. Appointment of a practitioner within 3 months of qualification and subject to National Service Acts would be limited to 6 months.

Applications, stating age, details of qualifications, and experience, and nationality should be forwarded immediately to H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts which are vacant on the dates indicated :—

Park Hospital, Davyhulme (General Hospital—426 Beds)

HOUSE OFFICER (E.N.T. surgery), now vacant.
HOUSE OFFICER (non-tuberculous thoracic surgery), now vacant.

Vacancies occur periodically in the various departments at Park Hospital and House Officers are eligible for appointment to another specialty at the end of the original term of service when such vacancies occur.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

SENIOR HOUSE OFFICER, now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Salaries for House Officer posts £350–£450 p.a., according to experience. £100 p.a. deduction for residential accommodation and services. 6 months appointments. The Senior House Officer's appointment will be for 12 months at a salary of £670 p.a., less £130 p.a. for residential accommodation and services.

Application forms from the Secretary, Park Hospital, Davyhulme, Manchester.

NUNEATON. GEORGE ELIOT HOSPITAL. (258 Beds.) HOUSE SURGEON required. Post offers considerable opportunity for experience in general surgery.

Applications to the Medical Superintendent.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead, BERKS. (100 Beds.) CASUALTY OFFICER required immediately. Salary authorised at £50 p.a. higher than the standard rate.

Applications, stating age, qualifications with dates, and experience, together with copies of 2 testimonials, should be sent to the Administrative Officer.

MERTHYR TYDFIL. MERTHYR GENERAL HOSPITAL. (120 Beds.) RESIDENT SURGICAL OFFICER. The post offers a very good all-round experience in general surgery. Salary £670 p.a., less £100 p.a. for board, lodging, &c. Applicants must have been registered not less than 1 year as a medical practitioner and have previously held house appointments. Appointment for 1 year in the first instance.

Applications, with names of 2 referees, to the Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil, as soon as possible.

NEWCASTLE GENERAL HOSPITAL. (884 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. Applications are invited from registered medical practitioners for the post of RESIDENT OBSTETRICAL HOUSE SURGEON to the above Department (70 Beds). The duration of the appointment will be for 6 months, but consideration may be given to the possibility of alternating the post with that of the House Surgeon to the Gynæcological Department. The department is recognised by the Royal College of Obstetricians and Gynæcologists for the Diploma of M.R.C.O.G., and D.Obst. R.C.O.G., and undertakes the training of medical students. Salary according to terms and conditions of the National Health Service according to experience. The post is vacant on 1st February, 1952.

Applications should be sent without delay, together with 1 copy of 2 recent testimonials, or the names and addresses of 2 referees, to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE UPON TYNE. HOSPITAL FOR SICK CHILDREN. NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the posts of 2 RESIDENT HOUSE OFFICERS (combined medical and surgical duties), 1 post vacant 1st February and the other 1st March, 1952. Both tenable for 6 months. Salary £350–£450 p.a., according to experience, less £100 for residential emoluments.

Applications, stating age, qualifications, and experience, with a copy of 3 testimonials, to—

J. B. CAIRNCROSS, C.A., House Governor and Secretary.

Great North-road, Newcastle upon Tyne, 2.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited from registered medical practitioners (Male and Female), including R practitioners within 3 months of qualification, for appointments which become vacant on 1st February, 1952. The appointments are resident and tenable for 6 months, and successful applicants will be allocated to 1 of the following posts :—

HOUSE PHYSICIANS.
HOUSE SURGEONS.
HOUSE PHYSICIANS to Children's Department.
HOUSE SURGEONS to Professorial Surgical Clinic.
HOUSE SURGEONS to Gynæcological Department.
HOUSE SURGEONS to Princess Mary Maternity Hospital.
HOUSE SURGEON to Throat, Nose, and Ear Department.
HOUSE SURGEONS to Orthopædic Department.
HOUSE SURGEON to Skin Department.
HOUSE SURGEONS to Accident Room.
SENIOR ACCIDENT ROOM HOUSE SURGEON AND DEPUTY RESIDENT MEDICAL OFFICER.
HOUSE PHYSICIAN to Bacteriological Department.

The posts of Junior House Surgeon in the Gynæcologica Department and Junior House Surgeon in the Princess Mary Maternity Hospital are interchangeable, 3 months in each department. Salary £350–£450 p.a., according to experience. The appointments are subject to the terms and conditions of the National Health Service for hospital medical staff.

Applications on the official form should be submitted immediately. A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Applications are invited from registered medical practitioners for the appointment of Whole-time SENIOR REGISTRAR to the Orthopædic Department. The successful candidate will have opportunity for clinical experience in outpatient and inpatient work under the direction of the Head of the Department, and will be responsible for clinical emergency duty as required. This is the teaching hospital of the University of Durham and the successful candidate will be required to teach in his subject principally at the Royal Victoria Infirmary. The successful candidate must hold a Fellowship of the Royal College of Surgeons. The appointment is for 1 year in the first instance and the salary will be in accordance with the Ministry of Health terms and conditions of service.

Applications, giving age, nationality, experience, and qualifications, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional BLOOD TRANSFUSION SERVICE. REGISTRAR PHYSICIAN (whole-time) required for the above Service. Salary £775 p.a. Appointment up to 31st August, 1952, in the first instance. Duties include collection of blood from donors in the Northern Region and serology in the laboratories at the Blood Transfusion Centre, Newcastle.

Applications, together with names and addresses of 1–3 referees and/or 1–3 testimonials, to be addressed to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle on Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. MARY'S HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR PSYCHIATRIST (whole-time), resident. Salary £775–£890, according to experience. Appointment up to 31st August, 1952, in the first instance, subject to National Health Service (Superannuation) Regulations, 1950. Arrangements can be made for the person appointed to take the necessary courses of study for the University of Durham Diploma in Psychological Medicine.

Applications, together with 1–3 referees and/or 1–3 testimonials, should be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) NORTHAMPTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON, vacant about the second week in January next. Recognised for the F.R.C.S. Ministry of Health salary scale and conditions of service for House Officers. Appointment in the first instance until 31st March or 30th September, 1952, to be determined at interview.

Applications, giving particulars, and enclosing copies of 3 recent testimonials, should be sent as soon as possible, addressed to S. G. HILL, Secretary to the Management Committee.

NOTTINGHAM GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Locum ORTHOPÆDIC REGISTRAR required whole-time for 6 weeks. Resident at the above Hospital. Salary £775 p.a. Excellent clinical and practical experience under Consultant. To commence duty as soon as possible.

Apply to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER for the Casualty Department. Duties to commence as soon as possible. Salary £670 p.a., less £150 emoluments. Terms and conditions of service as laid down by Ministry Regulations.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Nottingham NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (diagnostic radiology), non-resident. Duties to commence as soon as possible. The successful candidate will be required to undertake routine visits to other hospitals in the Nottingham area. Salary and conditions of service in accordance with the Ministry of Health regulations.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Nottingham NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (orthopædic), duties to commence as soon as possible. Duties will relate mainly to accident and fracture cases both inpatients and outpatients and include orthopædic cases. Previous experience of this type of work is essential. Salary and conditions of service in accordance with the Ministry regulations.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC AND FRACTURE HOUSE SURGEON. The post offers exceptional experience in traumatic surgery. Duties to commence as soon as possible. Salary £350, £400, or £450 p.a., less £100 residential emoluments, according to experience. Appointment for 6 months in the first instance.

Applications, with copies of testimonials, should be sent as soon as possible to—

HENRY M. STANLEY, Secretary,
Nottingham No. 1 Hospital Management Committee.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Required, SENIOR HOUSE OFFICER (surgical) for the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence as soon as possible. Salary £670 p.a. and conditions of service in accordance with the published conditions of the Ministry of Health.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the undersigned. HENRY M. STANLEY, Secretary,
Nottingham No. 1 Hospital Management Committee.

OTLEY, YORKS. THE GENERAL HOSPITAL. (260 Beds—with full Consultant staff who are members of the teaching staff of Leeds University.) RESIDENT SENIOR HOUSE OFFICER (casualty) required. Salary at the rate of £670 a year, less £130 for full residential emoluments.

Applications, stating age, qualifications, nationality, and experience, with copies of 2 recent testimonials, to be addressed to the undersigned at the Hospital.

E. W. BEST, Secretary,
Ilkley and Otley Hospital Management Committee.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in General Medicine to the hospitals of the Swindon area. The appointment will be for 1 year and eligible for extension to 2 years.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 12th January.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the whole-time non-resident post of REGISTRAR in Pathology to these Hospitals. The appointment will be for 1 year and eligible for extension to a second year.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 12th January.

PENZANCE. WEST CORNWALL HOSPITAL. (General Hospital—100 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY HOUSE SURGEON, post vacant 21st January, 1952. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, West Cornwall Hospital, Penzance.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE SURGEONS (second or third posts), Freedom Fields Section, vacant on 4th and 14th January, 1952, recognised for the Fellowship of the Royal College of Surgeons.

(2) HOUSE SURGEON (second or third post), Greenbank-road Section, vacant 1st February, 1952; recognised for the Fellowship of the Royal College of Surgeons.

(3) SENIOR HOUSE OFFICER to Casualty and Fracture Department, Greenbank-road Section, vacant 5th January, 1952. The appointment will be for a period of 12 months, and is renewable. Salary at £670 p.a.

The appointments (excepting no. 3) will be for a period of 6 months. Salary and conditions of service in accordance with the National Health Service terms.

Applications, stating age, nationality, qualifications, and experience, together with 3 recent testimonials, to—

ARTHUR R. CASH, Secretary.

Head Office, Greenbank-road, Plymouth.

PONTEFRACT AND CASTLEFORD HOSPITAL MAN-AGEMENT COMMITTEE. The following post will be vacant on the date mentioned. An appropriate deduction will be made for emoluments :—

Pontefract General Infirmary

RESIDENT CASUALTY OFFICER (second or third post), now vacant. Salary £400 or £450 p.a.

Applications, with names of 2 referees, to be forwarded to the Secretary of the Committee, Great Northern House, Salterrow, Pontefract, Yorks. W. BOWRING, Secretary.

PONTYPRIDD (near). EAST GLAMORGAN HOS-PITAL, CHURCH VILLAGE. (316 Beds—Committee's Base Hospital serving population of 177,000.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. There are vacancies at this Hospital for 3 HOUSE OFFICERS (surgical), first or second posts. 1 to commence on 16th January and 2 to commence on 1st February.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent to the Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PRESTON ROYAL INFIRMARY. (400 Beds.)

SENIOR HOUSE OFFICER (pathological).
CASUALTY OFFICER.
GENERAL HOUSE SURGEON.
HOUSE SURGEON (orthopædic).
RESIDENT SENIOR HOUSE OFFICER (anæsthetics), Senior House Officer grade. Recognised for D.A.
ANÆSTHETIC HOUSE OFFICER. Recognised for D.A.

Applications should be made immediately to the Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston. JOHN GIBSON, Secretary.

PRESTON ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (Eye Department). Some other duties in group. Post recognised for D.O.M.S.

Applications, with full details and references should be sent to the undersigned at the Royal Infirmary, Preston.

JOHN GIBSON, Secretary.

PRESTON AND CHORLEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to Group Pædiatric Department. Duties at the Royal Infirmary and Sharoe Green Hospital, Preston and District Hospital, Chorley.

Applications, with full details and references should be sent to the undersigned at Royal Infirmary, Preston.

JOHN GIBSON, Secretary.

REDRUTH. CAMBORNE-REDRUTH MINERS' AND GENERAL HOSPITAL. (4 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum SENIOR HOUSE OFFICER (surgical) for a period of 2 months, pending review of establishment. Salary at the rate of £670 p.a., less a deduction of £150 p.a. in respect of residential emoluments.

Applications, stating age, qualifications, and experience, together with copies of 3 testimonials, should be sent to the Administrative Assistant.

RHONDDA. PORTH AND DISTRICT HOSPITAL. (110 Beds—this Hospital is visited regularly by Consultants from the Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (first or second post), duties mainly surgical.

Applications, stating age, qualifications, experience, together with copies of 2 recent testimonials, to be sent as soon as possible, to the Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

READING AREA DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. Applications invited from registered medical practitioners for appointment as HOUSE SURGEON, vacant 1st January, 1952, for period of 6 months. Salary £400 or £450, less £100 board, residence, &c.

Applications, stating age, nationality, qualifications with dates, present post, with copies of 3 recent testimonials, to Administrative Officer, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications invited from registered medical practitioners (Male) as RESIDENT ASSISTANT PATHOLOGIST (House Officer grade), vacant 7th January for 6 months. Previous experience in pathology not necessary. Salary £350–£450 p.a., less £100 deduction for board-residence.

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 3 recent testimonials, to Administrative Officer.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the position of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (chest diseases). The successful applicant will be a member of the Chest Team for the Rochdale group of hospitals, be mainly employed in Wolstenholme Pulmonary Hospital, Springfield Sanatorium, and Tuberculosis Clinics and will be required to reside at Marland Hospital. Remuneration will be £700–£50–£1000 p.a., and there will be a deduction of £130 p.a. in respect of board and lodging.

Applications, stating age, qualifications, experience, and giving the names of 2 referees, should be forwarded to the undersigned immediately. S. HODKINSON, Secretary.

Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE. BIRCH HILL HOSPITAL. Applications are invited for the position of HOUSE OFFICER for duties in the Pædiatric Department, together with general duties in the Hospital. Salary and conditions in accordance with the terms of service for medical staff in the Health Service.

Applications should be forwarded to—

S. HODKINSON, Secretary, Rochdale and District Hospital Management Committee.

Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE INFIRMARY. (General—109 Beds.) Applica-tions are invited for the appointment of SENIOR HOUSE OFFICER (orthopædic). The appointment will be for 1 year. Salary in accordance with the terms of service of medical staff in the National Health Service—i.e., £670 p.a. This appointment is recognised by the Royal College of Surgeons for 6 of the 12 months period of surgical training required of candidates for the Final Fellowship examination.

Applications should be forwarded to—

S. HODKINSON, Secretary, Rochdale and District Hospital Management Committee.

Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE INFIRMARY. (General—109 Beds.) Appli-cations are invited for the appointment of HOUSE PHYSICIAN. The appointment will be for 6 months. The remuneration will be in accordance with the terms of service for hospital medical staff—i.e., £350, £400 or £450 p.a., according to experience.

Applications should be sent to the undersigned immediately.

S. HODKINSON, Secretary, Rochdale and District Hospital Management Committee.

Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (602 Beds.) SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (House Officer grade). The appointment is tenable for 6 months and will be vacant on 30th January, 1952.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 testimonials, should be forwarded to the undersigned at the General Hospital, Rochford, Essex, not later than 11th January, 1952.

J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (602 Beds.) Applications are invited from registered medical practitioners for RESIDENT HOUSE SURGEON (House Officer grade) for a period of 6 months. The post becomes vacant on 17th January, 1952.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the undersigned at the General Hospital, Rochford, not later than 11th January, 1952. J. C. FIELD, Secretary.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (247 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON (Woman) for duties in the Gynæcological Unit comprising 25 gynæcological and 6 maternity beds at the above Hospital. Previous experience not necessary. Post tenable for 6 months from 1st February, 1952.

Applications, stating (in order) age, qualifications with dates, present appointment and details of experience, accompanied by copies of 2 recent testimonials or names of referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford. Applicants may see the Hospital by arrangement with the Medical Superintendent (Telephone : Romford 7711).

SKIPTON GENERAL HOSPITAL, Skipton, Yorkshire, WEST RIDING. (64 Beds—Full Consultant Staff.) Applications are invited for the appointment of HOUSE SURGEON (first, second, or third term), either sex, now vacant. 6 months appointment. Salary in accordance with the National Health Service terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, stating age, qualifications, experience, and nationality, together with copies of recent testimonials, to be forwarded as soon as possible to the Secretary, Bingley, Keighley, Skipton and Settle Hospital Management Committee, St. John's Hospital, Keighley, Yorkshire.

ROTHERHAM. DONCASTER GATE HOSPITAL. (155 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic). Salary £670 p.a., less £140 p.a. residential emoluments.

Applications, stating age, experience, and nationality, with names of 3 referees, to be addressed to the Secretary, Hospital Management Committee, "Fern Bank," Doncaster-road, Rotherham.

SALFORD. HOPE HOSPITAL. Salford Hospital Manage-MENT COMMITTEE. Applications are invited for the position of SENIOR HOUSE OFFICER (medical), which becomes vacant in the middle of January.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should be addressed to the Superintendent, Hope Hospital, Salford, 6, to arrive not later than 14 days after the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ORTHOPÆDIC SENIOR HOUSE OFFICER. A wide variety of experience in orthopædic conditions is available.

Applications, together with the names of 2 referees, should be sent immediately to the Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCARBOROUGH HOSPITAL. Yorkshire. (163 Beds.) Applications are invited from Male or Female, registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN which will become vacant in early February. The salary is in accordance with the national scale and the appointment will be for 6 months.

Applications, stating age, and qualifications, with testimonials, to be sent to the Secretary.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the following appointments, which will be for 1 year in the first instance :—

(i) SENIOR REGISTRAR for Regional duties in Thoracic Surgery, with appropriate hospital attachments ;

(ii) SENIOR REGISTRAR in Psychiatry for duties at Glasgow Royal Mental Hospital and Associated Clinics.

The above appointments will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating age, qualifications, and experience, and present appointment, and giving the names of 3 referees, should be submitted not later than 14th January, 1952, to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for a number of posts of SENIOR HOUSE OFFICER under a joint training scheme in hospital and general practice, in which the Board and the Executive Council for the County of Inverness are associated. The scheme will provide a combined training of 2 years duration for young medical practitioners intending to enter medical practice or a specialty. Concurrent experience in hospital and general practice will be given in various departments of the hospitals at Inverness and with selected general practitioners in the town and surrounding district. The posts are non-resident, and the salary is £670 p.a.

Candidates should apply by 19th January, 1952, on forms obtainable from the undersigned, by whom further particulars will be supplied on request.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SOUTHAMPTON GENERAL HOSPITAL. (453 Beds.) HOUSE SURGEON (resident) to General Surgical Unit required at the end of December. Post tenable for 6 months. Salary and conditions of service as laid down by Ministry of Health.

Applications, with copies of testimonials, to be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) 2 CASUALTY OFFICERS/SENIOR HOUSE OFFICERS (orthopædic) required immediately for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) HOUSE PHYSICIANS (2), resident, required, posts vacant towards end of January and mid-February, and tenable for 6 months. Salary and terms and conditions of service as laid down by the Ministry of Health.

Applications, with copies of testimonials, to be forwarded to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) HOUSE SURGEON required towards end of December. Post tenable for 6 months.

Applications, with copies of testimonials, to be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA GENERAL HOSPITAL, Prittle-WELL CHASE. Required, SENIOR HOUSE OFFICER (surgical), post vacant 31st January, 1952. Salary £670 p.a., less deduction for full residential emoluments.

Applications, stating age, qualifications, and experience, with copies of recent testimonials, to reach the undersigned by 31st December, 1951.

J. C. FIELD, Secretary,
Southend-on-Sea Group Hospital Management Committee.

SHEFFIELD. CITY GENERAL HOSPITAL. (868 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited for the non-resident post of Whole-time SENIOR ANÆSTHETIC REGISTRAR at the above Hospital. There is a Department of Thoracic Surgery. A Regional Cardiological Centre and Professorial Gynæcological Unit will be opened in the immediate future. Candidates must be in possession of the D.A. The appointment is for 1 year in the first instance, reviewable annually.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to reach him not later than 7th January, 1952.

SHEFFIELD. MIDDLEWOOD HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR (psychiatry) to the above Hospital which is a recognised training hospital for the D.P.M. Residential accommodation is available. The appointment is for 1 year in the first instance, and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 7th January, 1952.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited from registered medical practitioners for the resident post of REGISTRAR to the Department of Neurology at the above Hospital.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should be forwarded immediately to—

KENNETH SUMNER, Chief Administrative Officer,
The United Sheffield Hospitals.
Central Office, The Royal Hospital, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. SHEFFIELD CENTRE FOR THE INVESTIGATION AND TREATMENT OF RHEUMATIC DISEASES. Applications are invited from registered medical practitioners for the non-resident post of REGISTRAR to the above Centre. Previous experience in this work not essential.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should be forwarded to—

KENNETH SUMNER, Chief Administrative Officer,
The United Sheffield Hospitals.
Central Office, West-street, Sheffield, 1.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. Applications are invited for a post of HOUSE OFFICER. Facilities are afforded junior staff to become versed in all branches of psychiatry. Salary scale and conditions of service in accordance with those laid down by the Ministry of Health, less deductions for board and lodging if resident.

Applications, giving full details, and copies of 3 recent testimonials, should be sent to the Physician-Superintendent within 14 days of appearance of this advertisement.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC SENIOR REGISTRAR (resident or non-resident) required for 1 year. This Hospital undertakes all modern psychiatric therapies, both physical and psychotherapeutic, and the medical staff conduct several psychiatric outpatient clinics.

Application forms obtainable from, and returnable to, Physician-Superintendent, St. Bernard's Hospital for Nervous and Mental Disorders, Southall, Middlesex, within 2 weeks of the date of this advertisement.

SLOUGH. UPTON HOSPITAL. House Physician required for post vacant 3rd February, 1952. Salary on national scale.

Applications, stating age, experience, and qualifications with dates, together with the names of 2 referees, should be sent to the Administrative Officer.

SHREWSBURY GROUP 15 HOSPITAL MANAGEMENT COMMITTEE. Locum MEDICAL OFFICER required for the Cross Houses Hospital, Cross Houses, near Shrewsbury (183 Beds), post now vacant. Salary £350–£450 p.a., less £100 p.a. in respect of residential emoluments.

Applications should be made to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury. J. P. MALLETT, Secretary.

SHREWSBURY (near). CROSS HOUSES HOSPITAL. (183 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER, vacant immediately. Preference will be given to those applicants with previous obstetrical experience. Salary £350–£450 p.a., less £100 p.a. in respect of residential emoluments.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Secretary,
Shrewsbury Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON (second or third post) to a General Consultant Surgeon. The post is vacant immediately, tenable for 6 months, and the post is recognised for the F.R.C.S. Salary as laid down by the Ministry of Health.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Secretary,
Shrewsbury Group 15 Hospital Management Committee.
18th October, 1951.

SHREWSBURY. ROYAL SALOP INFIRMARY. (240 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON (second or third post) to a General Consulting Surgeon. The post is vacant immediately and tenable in the first instance for a period of 6 months.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Secretary,
Shrewsbury Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury, 2nd November, 1951.

SHREWSBURY. ROYAL SALOP INFIRMARY. (240 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of HOUSE SURGEON/CASUALTY OFFICER, vacant immediately. Salary £350–£450 p.a., less a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Secretary,
Shrewsbury Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury.

SOUTHERN AYRSHIRE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for appointments in the undernoted hospitals on 1st February, 1952 :—

HOUSE SURGEONS (General and Plastic Unit), Ballochmyle Hospital, Mauchline.

HOUSE PHYSICIAN, CASUALTY OFFICER, and HOUSE SURGEONS, Ayr County Hospital.

HOUSE SURGEON, Seafield Children's Hospital, Ayr.

Tenure of posts 6 months. Salary £350–£450, in accordance with experience, less deduction of £100 p.a. for residential emoluments.

Applications to the Acting Administrative Medical Officer, Ballochmyle Hospital, within 14 days of the appearance of this notice.

STAFFORD. STANDON HALL ORTHOPÆDIC HOS-PITAL, near ECCLESHALL, STAFFORD. Applications are invited from suitably qualified medical practitioners (Male or Female) for the post of SENIOR HOUSE OFFICER. Salary £670 p.a., less deduction for residential emoluments.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to the undersigned immediately.

H. H. JONES, Secretary,
Stafford Hospital Management Committee.
13, Foregate-street, Stafford.

ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. (102 Beds.) SENIOR HOUSE OFFICER required for Hospital specialising in urology, E.N.T., gynæcology, and children's surgery, post vacant 6th January, 1952. Duties will be primarily in connection with urology and children's surgery. National salary scale and conditions—viz., £670 p.a., less £150 for full board.

Applications, with names of 2 referees, should be sent as soon as possible to— H. A. FROGGATT, Secretary,
Hospital Management Committee (Hastings Group).
11, Holmesdale-gardens, Hastings.

STOCKPORT. STEPPING HILL HOSPITAL. (464 Beds.) Applications are invited for the vacant posts of 2 HOUSE PHYSICIANS, 1 post will be resident and the other non-resident.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees or copies of 2 testimonials, to be addressed to the Medical Superintendent.

H. G. PRICE, Secretary,
Stockport and Buxton Hospital Management Committee.

STOCKPORT INFIRMARY, Cheshire. (175 Beds.) Applications are invited for the post of RESIDENT HOUSE OFFICER (general surgery and ophthalmology), approved under D.O.M.S. regulations, which is now vacant.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, or copies of 2 testimonials, to be addressed to the Administrative Officer.

H. G. PRICE, Secretary,
Stockport and Buxton Hospital Management Committee.
13th December, 1951.

STOKE-ON-TRENT HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for the following posts in the Group Hospitals :—

City General Hospital, Stoke-on-Trent (964 Beds)

(i) HOUSE OFFICER (surgical), vacant 1st February, 1952. Recognised for F.R.C.S.
(ii) HOUSE OFFICER (medical), 2 posts, vacant immediately and 1st February, 1952, respectively.
(iii) HOUSE OFFICER (pædiatrics), vacant 15th February, 1952. Recognised for D.C.H.

North Staffordshire Royal Infirmary, Stoke-on-Trent (475 Beds)

(i) HOUSE OFFICER (medical and pædiatrics), vacant 1st February, 1952.
(ii) SENIOR HOUSE OFFICER (orthopædics), vacant now. Recognised for F.R.C.S.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the undersigned at Head Office, Hospital Management Committee, Princes-road, Stoke-on-Trent. THORNBURROW GIBSON, Secretary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) Applications are invited for the post of HOUSE OFFICER (general surgery), vacant immediately. Post recognised for F.R.C.S. examination.

Applications, with copy testimonials, should be forwarded as soon as possible to—

THORNBURROW GIBSON, Secretary,
Stoke-on-Trent Hospital Management Committee.
Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.), Male or Female. Post recognised for D.L.O. and F.R.C.S. Eng.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to—

THORNBURROW GIBSON, Secretary,
Stoke-on-Trent Hospital Management Committee.
Princes-road, Stoke-on-Trent.

ST. ALBANS CITY HOSPITAL. (425 Beds.) Applications are invited from registered medical practitioners for the appointment of a HOUSE PHYSICIAN (House Officer grade) to one of the 2 medical teams. Post vacant immediately and tenable for 6 months in the first instance.

Applications, together with the names of 2 referees, should be forwarded to the Secretary, Mid Herts Group Hospital Management Committee, Normandy-road, St. Albans.

TAPLOW, near MAIDENHEAD, BERKS. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON to the Unit of Obstetrics and Gynæcology required for post vacant 3rd March, 1952. Post recognised for M.R.C.O.G. Preference will be given to candidates who have had previous experience in midwifery and gynæcology. Salary on national scale.

Applications, stating age, experience, and qualifications with dates, together with copies of 2 testimonials should be sent to the Administrative Officer.

TILBURY AND RIVERSIDE GENERAL HOSPITAL (ORSETT BRANCH). Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON for the General Surgery and Orthopædic Departments. The appointment will be for 6 months in the first instance and the salary scale £400–£450 p.a., according to experience, less £100 residential emoluments.

Applications, together with copies of not more than 3 testimonials, should be forwarded to the undersigned as soon as possible. G. E. WHYTE, Secretary,

South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

TILBURY AND RIVERSIDE GENERAL HOSPITAL (ORSETT BRANCH). Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN at the above Hospital. The duties for this post cover a wide range of medical work—i.e., general medical, skins, neurology, infectious diseases. The appointment will be for 6 months in the first instance. Salary scale will be at the rate of £400–£450 p.a., according to experience, less £100 residential emoluments. Post is vacant from 21st January, 1952.

Applications, together with copies of not more than 3 recent testimonials, should be forwarded to the undersigned as soon as possible. G. E. WHYTE, Secretary,

South East Essex Hospital Management Committee.
Thurrock Hospital, Grays, Essex.

TORQUAY. TORBAY HOSPITAL. (166 General Beds.) RESIDENT SENIOR SURGICAL HOUSE OFFICER (Male or Female) required immediately. Appointment for 1 year. Salary £670 p.a., less £100 in respect of accommodation and services.

Applications, stating qualifications, nationality, and age, with copies of testimonials, to be sent to the Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of JUNIOR HOUSE PHYSICIAN AND HOUSE SURGEON (E.N.T.). Salary £350–£450 p.a., depending on experience, with £100 p.a. deduction in respect of residential emoluments.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 2 vacancies of RESIDENT SENIOR HOUSE SURGEON to the Orthopædic and Traumatic Department, which occur on 12th January and 7th February, 1952. This is a large and busy specialty with 2 Consultants, 70 Beds and deals with the greater part of the casualties in West Cornwall. The post is tenable for 1 year at a salary of £670, less £100 for emoluments, and subject to the regulations of the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Administrative Assistant without delay.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer status), which falls vacant on 4th February, 1952. The post is tenable for 1 year at a salary of £670, less £100 for emoluments, and subject to the regulations of the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Royal Cornwall Infirmary, Truro, England.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN (Male or Female), post vacant 1st March, 1952. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, giving details of age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the office of HOUSE SURGEON in an extremely active general hospital doing major surgery and with busy Outpatient Departments, post vacant 1st February, 1952. The appointment will be resident and tenable for 6 months. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, enclosing copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE SURGEON (Male or Female) for General Surgery and Gynæcology, post vacant 18th March, 1952. The successful candidate will be responsible jointly with the House Surgeon for the 74 Beds allocated to the 2 specialties. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, stating age, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds, 8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the vacancy of SENIOR RESIDENT HOUSE OFFICER to the Orthopædic and Traumatic Department, which is now vacant. This is a large and busy centralised unit with 2 Consultants, 64 Beds and Outpatients' Departments. In addition to this there is an Orthopædic Rehabilitation Annexe of 45 Beds. The post is tenable for 1 year, at a salary of £670, less £100 for emoluments and subject to the regulations of the Ministry of Health.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Administrative Assistant, Royal Cornwall Infirmary, Truro, without delay.

VENTNOR. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST, ISLE OF WIGHT. (249 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident), unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, should be sent to Physician-Superintendent.

WAKEFIELD. THE GENERAL HOSPITAL, Park Lodge- lane, WAKEFIELD. (160 Beds.) Applications are invited for the appointment of a HOUSE PHYSICIAN at the above Hospital. The post is resident and the salary scale £350–£450 p.a., less £100 as residential emoluments. Appointment vacant 1st February 1952.

Application forms may be obtained from the Medical Superintendent. W. READ, Secretary, Hospital
Management Committee No. 9, Wakefield A Group.

WAKEFIELD. THE GENERAL HOSPITAL, Park Lodge- lane, WAKEFIELD. (160 Beds.) Applications are invited for the appointment of an OBSTETRICAL HOUSE SURGEON at the above Hospital. The post is resident and the salary scale £350–£450 p.a., less £100 as residential emoluments. Appointment vacant 1st February, 1952.

Application forms may be obtained from the Medical Superintendent. W. READ, Secretary, Hospital
Management Committee No. 9, Wakefield A Group.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) Applications are invited for the post of RESIDENT ORTHOPÆDIC OFFICER (Senior House Officer grade) at the above General Hospital. The person appointed will be required to deputise for the Resident Surgical Officer. Terms and conditions of service in accordance with national recommendations and the post is subject to the National Health Service Superannuation Acts and Regulations thereunder.

Application forms may be obtained from the Administrative Officer. W. READ, Secretary, Hospital
Management Committee No. 9, Wakefield A Group.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade) at the above General Hospital. Terms and conditions of service are in accordance with national recommendations and the post is subject to the National Health Service Superannuation Acts and Regulations thereunder.

Application forms may be obtained from the Administrative Officer. W. READ, Secretary, Hospital
Management Committee No. 9, Wakefield A Group.

WORTHING GROUP HOSPITAL MANAGEMENT COM- MITTEE. WORTHING HOSPITAL AND COURTLANDS RECOVERY HOSPITAL. (273 Beds—5 Resident Officers.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON. R practitioners within 3 months of qualification or holding a first post may apply.

Applications to Administrative Officer, Worthing Hospital, Lyndhurst-road, Worthing, stating age, qualifications with dates, nationality, and details of experience, with 2 testimonials.

A. V. OAKTON, Secretary-Administrator.

WORTHING GROUP HOSPITAL MANAGEMENT COM- MITTEE. WORTHING HOSPITAL. (273 Beds—5 Resident Officers.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, vacant 4th January, 1952. Salary on the National Health Service scale according to experience subject to deduction for board, lodging, &c. Appointment subject to conditions of service for the National Health Service. R practitioners within 3 months of qualification or holding a first post may apply.

Apply to Administrative Officer, Worthing Hospital, stating age, qualifications with dates, nationality, and details of experience, with 2 recent testimonials.

A. V. OAKTON, Secretary-Administrator.

WATFORD. HOLYWELL HOSPITAL. Senior House OFFICER. Duties will include care of modern treatment unit for pulmonary tuberculosis (32 Beds) and may have some duties in other Watford hospitals. Would suit candidates working for a higher qualification.

Applications, together with copies of 2 testimonials, should be addressed to the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, as soon as possible after the appearance of this advertisement.

WATFORD AND DISTRICT PEACE MEMORIAL HOSPITAL, WATFORD, HERTS. (189 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital to fulfil the duties of Casualty Officer. Post vacant immediately. Salary £700–£50–£1000, less £120 for board-residence.

Applications, stating age, qualifications, and experience, together with 2 recent testimonials, should be sent to—

CYRIL HOPKINSON, Administrator.

WHISTON. COUNTY HOSPITAL. (682 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN. 6 months appointment. Salary £350–£450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, and experience, and giving 2 names for reference, should be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary, St. Helens and District Hospital Management Committee.

Group Office, County Hospital, Whiston, near Prescot, Lancs.

WILLESBOROUGH HOSPITAL, Willesborough, near ASHFORD, KENT. SOUTH EAST KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN at the above Hospital. The person appointed will be required for duty in the Medical Wards and busy Outpatients' Department under the supervision of Consultants visiting 4 times weekly. Fully equipped Cardiographic unit. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 responsible persons to whom reference may be made as to professional ability, should be addressed to the Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to the Senior Surgeon and Ophthalmological Departments, vacant 1st February, 1952.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 16, BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER (Fracture and Orthopædic Department).

HOUSE OFFICER (Fracture and Orthopædic Department).

HOUSE OFFICER (E.N.T. Department), vacant 1st January, 1952.

HOUSE OFFICER (Junior Casualty Officer).

HOUSE OFFICER (general surgery), vacant 31st January.

HOUSE OFFICER (general surgery), vacant 16th February.

HOUSE OFFICER (Pædiatric Department), vacant 4th February. Appointment recognised for D.C.H.

Wolverhampton and Midland Counties Eye Infirmary (recognised for the full course of instruction for admission to the D.O.M.S.)

HOUSE OFFICER, vacant now.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.

The Royal Hospital, Wolverhampton.

WORCESTER (near). POWICK MENTAL HOSPITAL. SOUTH WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE. A vacancy exists for a JUNIOR HOSPITAL MEDICAL OFFICER. Experience of mental hospitals is not essential but desirable. Salary will be on the scale £700–£50–£1000, according to experience, and the conditions will be according to the terms laid down for hospital medical staff. A deduction for residential emoluments of £150 p.a. will be made.

Applications, with copies of 3 testimonials, should be sent to the Medical Superintendent, Powick Mental Hospital, near Worcester.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS, AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital, to commence immediately. Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham, Powys, and Mawddach Hospital Management Committee,

Maelor General Hospital, Croesnewydd-road, Wrexham.

YORK. THE RETREAT. An Independent Registered Hospital for Mental and Nervous Illnesses, managed by a Committee of the Society of Friends (Quakers) require a SENIOR HOUSE OFFICER or JUNIOR HOSPITAL MEDICAL OFFICER (Woman). Preference will be given to members of the Society of Friends, but applications will be welcomed from those who are in sympathy with the aims and objects of the Society. Accommodation will be provided and the salary is according to the National Health Service scale.

Applications, together with the names of 2 referees, should be addressed to Dr. A. TORRIE, Physician-Superintendent.

The Retreat, York.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts:—

County Hospital, York (General Hospital of 269 Beds; full Consultant Staff)

EYE HOUSE SURGEON. Post is recognised for the D.O. and is vacant from 23rd January, 1952. The appointment is for 6 months in the first instance and can be renewed thereafter. Post is graded House Officer.

County Hospital, York (General Hospital of 269 Beds; full Consultant staff)

City Hospital, York (Modern General Hospital of 265 Beds; full Consultant staff)

E.N.T. HOUSE SURGEON. The E.N.T. Department (which is mainly at the County Hospital) has approximately 30 Beds, is recognised for the D.L.O., and offers excellent opportunities for learning the specialty. The appointment is for 6 months initially and is vacant immediately. Previous experience preferable but not essential. Residence available at the County Hospital. Post is graded House Officer.

Salary £350 for first post, £400 for second post, £450 for third post, less £100 for residence.

City Hospital, York (Modern General Hospital of 265 Beds; full Consultant staff)

CASUALTY AND ORTHOPÆDIC OFFICER. The post is graded Junior Hospital Medical Officer. Post vacant from 31st December, 1951. Salary £700–£50–£1000. Residence is available for which a charge of £153 p.a. will be made. Arrangements can be made for the person appointed to be non-resident or partly resident.

Applications, giving details of age, nationality, experience, and qualifications, together with the names of 2 referees, to be forwarded immediately to—

F. A. MILNES, Esq., F.H.A., A.L.A.A., Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

NEW YORK. ALBANY HOSPITAL. Internships and RESIDENCIES available in Albany Hospital, Albany, New York, 750-Bed General Hospital, directly associated with Albany Medical College. House Officers receive appointments in medical school.

Details on request.

NEW YORK. ALBANY HOSPITAL. Approved E.N.T. RESIDENCY available 1st July, 1952, at Albany Hospital, affiliated with Albany Medical College, Albany, New York. Salary $1200.

UNITED STATES PATHOLOGY RESIDENCY. Large general hospital, located in a medical centre. Active education programme for Senior House Officers in majority of specialties; current vacancy is in pathology. Previous experience in pathology not essential. Length of appointment 1 year minimal, residency is approved for 3 years. Salary depending upon experience, plus full maintenance.

Write: Address, No. 614, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Public Appointments

BIRMINGHAM. CITY OF BIRMINGHAM. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER (Male or Female) in the Maternity and Child Welfare Department. The duties, in addition to ordinary work in maternity and child welfare, will include work in connection with children of all ages in the care of the Children's Committee. Applicants should have had experience in work with mothers and children, including a 6 months resident post in a maternity hospital and in a children's hospital. The D.P.H. or D.C.H. will be considered an additional qualification. The salary scale is £850 p.a., rising by annual increments of £50 to a maximum of £1150 p.a., the commencing salary within that scale depending on the Medical Officer's experience. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, to the candidate passing a medical examination, and to 1 month's notice on either side.

Applications, endorsed "Assistant Medical Officer for Maternity and Child Welfare," giving full details of training and experience, together with copies of 3 recent testimonials, should be submitted on a form obtainable from the Medical Officer of Health, Council House, Birmingham, 3, and returned to him on or before 12th January, 1952.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (whole-time) required, initially in Area 4 (Finchley and Hendon). Duties mainly supervisor of health of mothers and young children and school health work. D.P.H. or equivalent an advantage. Salary £850–£50–£1150 p.a. inclusive. Established. Subject to medical assessment and prescribed conditions.

Applications (no forms), stating age, qualifications, experience, names of 2 referees, to Joint Area Medical Officer, Hendon Town Hall, the Boroughs, Hendon, N.W.4, by 12th January, 1952 (quoting K.270.L.). Canvassing disqualifies.

C. W. RADCLIFFE, Clerk of the County Council.

OLDHAM. COUNTY BOROUGH OF OLDHAM. Applications are invited from registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER. The possession of a D.P.H. is desirable but not essential. The appointment affords an excellent opportunity for obtaining experience in the Public Health and School Health Services. Salary £850–£50–£1150 p.a. The point of entry will be fixed in accordance with qualifications and experience. The appointment is superannuable and subject to medical examination.

Applications, stating age, qualifications, and experience, should be forwarded to the Medical Officer of Health, Public Health Department, Town Hall, Oldham, together with copies of 2 testimonials, or the names of 2 persons to whom reference may be made.

HIS MAJESTY'S COLONIAL SERVICE, Malaya. Doctors having medical qualifications registrable by the General Medical Council in the United Kingdom with 1 or more years experience after qualification, are required for appointment as :—

MEDICAL OFFICERS and MEDICAL OFFICERS OF HEALTH for general medical and health duties. A limited number of practitioners liable for call up under the National Service Act, 1948, may apply, and if appointed will be granted indefinite deferment of call up on completion of a minimum period of 1 tour of 3 years in the Malayan Medical Service.

Appointment is available :—

(*a*) on probation for permanent establishment ; (*b*) on employment from the National Health Service, and (*c*) on short-term contract with gratuity :—

(*a*) Permanent terms. Subject to 3 years probation, appointment is permanent with pension (non-contributory) at age 55. Salary is paid in the scale £952–£42–£1204–£1274–£42–£1652 p.a. There are many posts, specialist and administrative, available on promotion carrying higher salaries (up to about £2400 for the highest post). Promotion is often made before reaching the top (£1652) of the long scale. There is also a cost-of-living allowance at varying rates, according to family circumstances, subject to maximum of £336 p.a. for single men, and of £707 p.a. for married men with children (both rates higher when stationed in Singapore).

Note.—Doctors with more than 1 year's approved experience after age 25 (including service in H.M. Forces) enter the salary scale at points above the minimum according to their experience ; *and* 4 increments of salary are also given to holders of approved higher qualifications (e.g., F.R.C.S., M.R.C.P., D.P.M., D.A., &c.).

(*b*) National Health Service. Doctors may resign from the National Health Service but retain their superannuation rights during their time in Malaya (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Malayan salary on leaving Malaya at the end of their engagements. Emoluments as under (*a*) including incremental credit for experience and higher qualifications as in note under (*a*). Doctors so appointed may be considered for permanent terms at any time during their colonial employment provided they surrender their rights to the resettlement grant and payment by Malayan Governments of superannuation contributions.

(*c*) Contract terms. The contract will be for 3 years resident service, renewable for a further tour of 3 years by mutual agreement. Salary and cost-of-living allowance as under (*a*) including incremental credit for experience and higher qualifications as in note under (*a*). In addition a gratuity earned at the rate of £300–£450 p.a. according to salary is paid on expiry of contract.

Doctors on contract may be considered for appointment to the permanent establishment at any time on their agreeing to surrender their gratuity earning rights.

In all 3 types of appointment the rates of salary and gratuity refer to doctors eligible for "expatriate terms" under Malayan Regulations (i.e., those whose permanent homes are in the United Kingdom, Ireland, Australia, Canada, &c.).

The climate is, for the tropics, healthy. European children do well up to the age of about 6 and schools are available locally. Income-tax is payable at Malayan rates which are lower than those in the United Kingdom. Government quarters with heavy furniture are provided at a low rental, or an allowance is paid in lieu of quarters. Free passages are provided for the doctor, his wife, and children under the age of 10 (not exceeding 4 persons besides himself) on appointment and once each way during each tour of duty of 3–4 years. Generous home leave is granted and local leave is permissible. The social and recreational facilities in Malaya are good.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference no. 27215/242/51).

LIVERPOOL. CITY OF LIVERPOOL. Bacteriological DEPARTMENT. Applications are invited from registered medical practitioners for the appointment of DEPUTY CITY BACTERIOLOGIST. Salary in accordance with the scale—£1500–£250–£2000 p.a. Applicants should have sound academic training in bacteriology and the possession of a higher medical qualification is desirable. Administrative experience will be an advantage. The Bacteriological Department works in close association with the University Department of Bacteriology and deals with the bacteriological and serological work of the Public Health Laboratory Service of the City and other local authorities in the area, and is associated with the National Public Health Laboratory Service. The appointment is superannuable and subject to the standing orders of the City Council. Canvassing disqualifies.

Applications, with names and addresses of not more than 3 persons to whom reference can be made, must reach me not later than 7th January, 1952. Endorse envelopes "Deputy City Bacteriologist." THOMAS ALKER, Town Clerk.

Municipal Buildings, Liverpool, 2. (JA.2785.)

SWINDON. BOROUGH OF SWINDON. Appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Applications are invited from duly qualified medical practitioners holding a Diploma in Public Health or similar qualification for the appointment of Deputy to the Medical Officer of Health and Borough School Medical Officer who is also Area Medical Officer under the Wiltshire County Council. The salary and conditions of service will be in accordance with the recent Award of the Industrial Court. The present salary is at the rate of £1034 p.a., rising by 4 increments of £50 to a maximum of £1234 p.a. Assistance will be given in the provision of housing accommodation if required.

Forms of application and further particulars of the post may be obtained from the undersigned with whom applications should be lodged not later than Saturday, 19th January, 1952.

D. MURRAY JOHN, Town Clerk.

Civic Offices, Swindon, 18th December, 1951.

NOTTINGHAMSHIRE COUNTY COUNCIL. Kirkby-IN-ASHFIELD URBAN DISTRICT COUNCIL. Applications are invited from registered medical practitioners for the joint whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH to the Kirkby-in-Ashfield Urban District. Applicants must have had at least 3 years professional experience since qualifying, be experienced in the duties of Medical Officer of Health, School Medical Officer, and the care of mothers and young children, and possess a Diploma in Public Health. The salaries are in accordance with Awards 2285 and 2321 of the Industrial Court for Public Health Medical Officers holding mixed appointments, namely :—

(*a*) Assistant County Medical Officer : £863 12s. 8d.–£43 3s. 8d. p.a.–£993 3s. 8d. p.a.

(*b*) Medical Officer of Health : £281 16s. 5d.–£9 1s. 10d. p.a.–£318 3s. 9d. p.a.

Application forms and conditions of appointment are obtainable from my office and applications should reach me by 7th January, 1952.

K. TWEEDALE MEABY, Clerk of the County Council.

Shire Hall, Nottingham.

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER with additional public health duties. Applications are invited from registered medical practitioners (Men or Women) for the above whole-time post. The duties will chiefly concern School Health and Child Welfare Services. The possession of the D.C.H. or the D.P.H. and experience in connection with infectious diseases will be of advantage. The salary and conditions of service will be in accordance with the recent award of the Industrial Court—i.e., £850 p.a., rising by annual increments of £50 to £1150. Past experience will be considered in fixing the starting-point within this scale. The successful candidate must own and drive a car. The holder of this appointment (now vacant) also acted as occasional Deputy at the Hayley Green Isolation Hospital and to the Medical Officer of Health for the boroughs of Halesowen and Stourbridge, for which additional payment is made ; the appointed officer will be considered for all or any of these additional appointments. The post is superannuable, subject to medical examination and determinable by 3 months notice.

Applications, on forms to be obtained from the County Medical Officer, County Buildings, Worcester, should be returned to him by the 12th January, 1952.

W. R. SCURFIELD, Clerk of the County Council.

December, 1951. (V.242.)

General Practice

For an Executive Council post apply on form E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

HUMSHAUGH, near HEXHAM, NORTHUMBERLAND. Applications invited for VACANCY (rural) due to resignation. List at present 1493, all dispensing. Surgery available. Apply on E.C.16A not later than 8th January, 1952, to—

J. B. SMITH,

Clerk of the Northumberland Executive Council.

10, Ellison-place, Newcastle upon Tyne, 1.

Miscellaneous

Medical Officer qualified in tropical medicine, general medicine, and surgery, required by U.S. Industrial Company in British Guiana. Laboratory, field hospital, and general practice. Regular leave, furnished living quarters at nominal cost, 3 year contract. Starting salary £1800 annually.—Write, stating particulars, to : Address, No. 616, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Part-time Works Medical Officer required by Messrs. Thomas De La Rue and Company Limited, Gas Division, for 2 sessions weekly at factory at Warwick. Salary according to B.M.A. scale.—Address, No. 615, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Surgical Appliance Company requires use of fitting-room 1 or 2 days weekly within access to London.—Address, No. 617, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method." 24-hour service.—Send specimen of urine and £1 1s. fee to : M.O. LABORATORIES LTD., 26, Park-crescent, Portland-place, W.1 (Telephone : MUSeum 5386-7).

Please note new address.

Nameplates in bronze-enamel and brass. Send size and lettering for estimate.—OSBORNE, 117, Gower-street, London, W.C.1.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1 (MAYfair 7511).

Guineapigs, Rabbits of all types for research. Prompt delivery, keen prices.—GOODCHILDS RABBIT FARM, near Crawley, Sussex (Pound Hill 2167).

Warner Calendar of Medical History.

Medical Practitioners resident in the United Kingdom and Eire are advised to return their cards for the 1952 Warner Calendar of Medical History immediately. A few extra copies are available for doctors who have not previously received the Diary.—Write to : WILLIAM R. WARNER & CO. LTD., Power-road, London, W.4.

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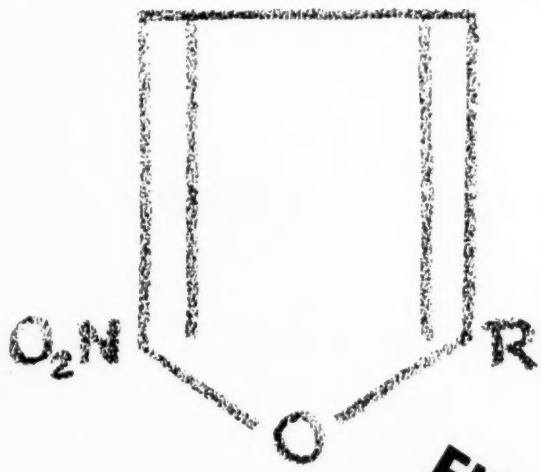

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